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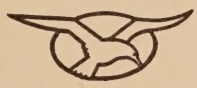
The camera on a camera boom, operated by man power, and perched on a truck to achieve greater height. The truck can be moved forward on its tracks so that the camera can make a "boom shot" or a shot swooping around the set in photographing this dance sequence from "Cain and Mabel." (Courtesy of Warner Brothers Pictures.)

WE MAKE THE MOVIES

Edited by

NANCY NAUMBURG



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CONTENTS

FOREWORD *Nancy Naumburg* . . xi

I. THE PRODUCER MAKES A PLAN *Jesse L. Lasky* (ASSOCIATE PRODUCER AT RKO-RADIO PICTURES) . . . 1

II. LOOKING FOR A STORY *Samuel Marx* (STORY EDITOR AT SAMUEL GOLDWYN'S) 16

III. THE STORY GETS A TREATMENT *Sidney Howard* (PLAYWRIGHT AND SCREEN WRITER) 32

IV. THE VOICE BEHIND THE MEGAPHONE *John Cromwell* (DIRECTOR AT SELZNICK-INTERNATIONAL STUDIO) 53

V. THE PRODUCTION TAKES SHAPE *Clem Beauchamp* (ASSISTANT SHORTS PRODUCER AT RKO-RADIO PICTURES) . 64

VI. DESIGNING THE SETS *Hans Dreier* (HEAD OF THE ART DEPARTMENT, PARAMOUNT PICTURES) . . . 80

VII. ON THE SPOT *Robert Edward Lee* (ASSISTANT DIRECTOR FOR MAURITZ STILLER, ROUBEN MAMOULIAN, FRITZ LANG) 90

VIII. THE PLAYERS ARE CAST *Phil Friedman* (CASTING DIRECTOR AT RKO-RADIO PICTURES) 106

IX. THE ACTRESS PLAYS HER PART *Bette Davis* (STAR AT WARNER BROTHERS STUDIO) 117

X. THE ACTOR PLAYS HIS PART *Paul Muni* (STAR AT WARNER BROTHERS STUDIO) 131

XI. SHOOTING THE MOVIES *John Arnold, A.S.C.* (HEAD OF THE CAMERA DEPARTMENT, METRO-GOLDWYN-MAYER STUDIO; FORMER PRESIDENT OF THE AMERICAN SOCIETY OF CINEMATOGRAPHERS) 143

XII. RECORDING AND RE-RECORDING *Nathan Levinson* (HEAD OF THE SOUND DEPARTMENT, WARNER BROTHERS STUDIO) 173

XIII. CUTTING THE FILM *Anne Bauchens* (CUTTER FOR CECIL B. DE MILLE, PARAMOUNT PICTURES) 199

XIV. SCORING THE FILM *Max Steiner* (MUSICAL COMPOSER AT WARNER BROTHERS STUDIO) 216

XV. DESIGNING FOR COLOR *Lansing C. Holden* (COLOR DESIGNER FOR *The Garden of Allah* AND *A Star Is Born* 239

XVI. MICKEY MOUSE PRESENTS *Walt Disney* (HEAD OF WALT DISNEY PRODUCTIONS) 253

BIOGRAPHICAL NOTES . . . 273

GLOSSARY 281

LIST OF ILLUSTRATIONS

Photographing a dance sequence from a camera crane Frontis.

FACING PAGE

Scene showing use of transparency background . . 4

Set of a New York tenement background 20

Showing use of studio tank in shooting scene in "Dodsworth" 36

John Cromwell rehearsing a scene from "The Prisoner of Zenda" 54

Shooting a close-up in "Winterset" 68

Elevation of a set for "Angel" 84

Model of a set for "Angel" 85

Shooting a scene on location 100

Dress extras in a concert hall set 116

Bette Davis between scenes 124

Bette Davis plays a scene 124

A scene from "Marked Woman" 125

Paul Muni in three stages of makeup for "Zola" . . 132

Playing a scene in "The Life of Emile Zola" . . . 133

The camera follows the actors in a scene for "Conquest" 148

Sound-recording crew in action 180

Re-recording room showing mixer at the console . . 181

The Moviola 212

Girls splicing film 212

Max Steiner conducting the recording orchestra . . 238

FACING PAGE

Making a color test 239

Shooting an outdoor scene in Technicolor 239

Progressive stages in drawing and painting a cell . . 260

A painted cell showing Minnie Mouse and Donald Duck superimposed over a background cell 260

Girls working on animated cartoon 260

FOREWORD

Nancy Naumburg

IT is the intention of this book to take the reader to a motion-picture studio and show him how a motion picture is actually made. The material for this book has been contributed by leading artists and technicians in Hollywood, each of whom describes his part in the production. The technique of the American film is the most highly developed and the most widely imitated of all motion-picture techniques. But few people outside of the industry are familiar with it. Actually, the processes involved are so varied and so complex, and each department has so many ramifications of its own, that it might be of some help to the reader to begin with a bird's-eye view of the main processes of motion-picture making.

The first thing of importance in making a film is to find a good story. This is probably the most difficult problem of the studios. While each has its own staff of writers, its story editor and staff of readers, who comb books, plays and magazines with the sole purpose of finding a story, still a good screen story is hard to find because it must have visual interest as well as a good plot and it must translate all situations into action. The search for stories would not be so difficult if more writers wrote directly for the screen rather than in another medium first.

The scarcity of screen material is so real that when the head producer of a studio finds a story he may buy it for certain stars or merely because it may have future possi-

bilities. Once a story is to go into production, he delegates its development to one of his assistants, an associate producer, whom he considers best fitted for this type of story. The first job of the associate producer is to find a writer. This also demands care in selection; he must find a writer whose talents suit the story. There are thousands of writers in Hollywood; he may choose one of the studio writers or one of the many free-lance writers. But the writer he chooses must be adept in following the story through the many drafts which are necessary before the story is ready for the cameras. The associate producer may call in other writers to work on the story; each will contribute something else: one perhaps new situations, another the dialogue and a third the continuity or final form of the screen play. But this practice does not make for the best screen plays. It is impossible to achieve unity in the story when each writer has a different conception of it. The practice of having several writers work on a story may account for the lack of consistency and slipshod treatment of many Hollywood films.

The story must be guided in its development by the director, who now enters the production and from this point on transforms the story from paper onto film. If he has not already been chosen by the head of the studio, the producer now sets out to find the director best fitted for this type of story. This is even more difficult than finding a writer, because the director is the most important individual in the production of a motion picture. He must visualize the picture on the screen. If he does not "feel" the story, he cannot make it into a convincing motion picture. Although many directors have great versatility, each seems to be temperamentally best fitted for a particular type of production. This is due to the fact that the stereo-

typing of film stories has made some directors specialists in their field. A director of fast-paced modern comedies, for example, will probably not excel in a subtle psychological drama.

The producer may have just the director in mind or he may approach several before he finds one who will evince enthusiasm for the story. Sometimes a director is not called in until the screen play assumes its final form, when, in all probability, he will want it completely rewritten to fit his ideas of the production. It is far better if the director collaborates with the writer on the story from the very beginning, and it is a considerable saving to the studio in time and money as well. The director should always be given complete freedom in executing his ideas for the production, since on the results of his guidance the picture will either stand or fall.

The director begins his activities with a discussion of the first draft of the story with the writer. This takes place in the first of a series of conferences which form the basis of all those careful preparations which must be made before the actual production begins. It will probably take three or four months before all departments, actors, writers and director are ready to start shooting. The Hollywood studios are noted for their extreme attention to detail; nothing must be overlooked; everything must be done to create the perfect illusion. The writer's first draft goes to the production office, which supervises the budgets and co-ordinates the activities of all departments in the various studio productions. Here the story must be estimated in terms of men and materials. The production manager in charge assigns an assistant or unit manager to supervise the problems and finances of the story. Now the director chooses an assistant, who is his man Friday, to represent

him in all conferences with the unit manager concerning the details of the production. Although they must agree on vital points, actually they represent two opposing camps: the assistant director the wishes of the director in expressing his conception of the story unhampered by restrictions, while the unit manager represents the production manager in zealously trying to keep the production within the budget and schedule assigned. Together they analyze the script so that each department will know its own needs for the budget. Each department has its own expenses, its own crew and the necessary materials for its work in the production, and, on this basis, each department submits its estimate.

Of course, none of the procedure is as simple as it sounds. For example, while the art department outlines sketches for the various sets, the director and writer may decide to change certain scenes in the story, thereby eliminating certain sets. This would alter the estimate of the art department as well as those of the carpentry, paint, plaster, upholstery, property and electrical departments, all of which are concerned with the construction and decoration of the sets. Actually, the work of all departments is so closely interwoven that what affects one department affects the entire fabric of production.

Now the director may call upon the music department and arrange for the type of scoring which will outline the mood of the story. He may want background music for certain scenes or he may want complete scoring throughout the film. Ordinarily one composer scores the film, but if it is a musical production, song writers must also be engaged. Although the composer will outline his themes, he does not write the complete score until after the picture has been photographed and edited, as the music must fit

the exact length of the scenes and these will not be determined until after they are cut and assembled. The best scores seem to be those in which themes identify the characters and are later developed and varied to fit the dramatic situations. Music is of great psychological importance in films; it has rarely been given the consideration it rightly deserves; the film score is a medium which should stimulate and marshal the best efforts of modern composers; it is one of the most powerful means of bringing significant music to the vast masses of people throughout the country.

At this point in the preparation, the writer and director complete the final version of the story or shooting script, from which the production will be photographed. It often happens that they have included scenes which must be eliminated when the script is passed upon by the office of the Association of Motion Picture Producers under the direction of Mr. Will H. Hays. This is the organization of producers which anticipates the taboos of various state censorship boards throughout the country. It can determine which scenes will pass the Kansas state board and which will pass the New York board; its regulations cover the footage of a kiss and the sanctity of the law. Obviously, the state censorship boards have done much to emasculate the American motion picture and to deprive it of its right to comment on institutions and behavior. The motion picture will never play a vital part in the shaping of American life if it is deprived of the right of free speech. There is no reason why the movies should be censored when newspapers, magazines and the theater are unhampered. As sources of potential harmful influence to adolescents, these are no less potent. The inanity of many Hollywood stories is due in no small measure to the

bigotry of those unnamed ladies and gentlemen who comprise the censor boards of the various states.

When the necessary changes have been made in the script, the assistant director maps out a shooting schedule which is the blueprint for the actual production. This fixes the starting and finishing dates and groups the scenes according to set or location, which both saves time and curtails actors' salaries. This procedure prevents the director from shooting his scenes in the continuity of the script. He must therefore keep his sense of the whole firmly in mind. The actors must work themselves into their scenes without preliminary build-up, and the script girl, who acts as his secretary on the set, must keep a record of all details of the scenes so that they will tally when they are assembled in sequence. The shooting schedule also informs the wardrobe department of all costume changes for the players and the property department of all props to be used. Everything is detailed to insure the maximum efficiency, as the loss of an hour may cost the studio thousands of dollars.

With the stars already chosen by the producer, the casting director enters the production to select the supporting players and submit his choice to the producer and director. Now the final preparations are made before the actual production starts: the sets are built and decorated, the stars tested for make-up and wardrobe and the director confers on last-minute changes with the writer and the various departments.

The actual shooting begins. This generally takes about a month, although some productions take much longer. To an outsider, more time is wasted on the set than seems necessary. In an eight-hour day only three to six minutes of film are shot which will be seen in the theaters. But the

long waits are a necessary part of production. It is during these that the careful technical adjustments of lights, camera and sound are made which distinguish the Hollywood film technique and account for its technical excellence. The director rehearses a scene and, when he is ready, the cameraman shoots it. If there is the slightest doubt in anyone's mind, he will retake the scene again and again until everyone is satisfied. Once a scene is shot, it can neither be changed nor improved, and if it is not perfect from every angle it must be discarded.

The director may want the editor, or cutter as he is also called, to stand by during the shooting so that he can facilitate the continuity of the screen play by suggesting certain connecting shots which will be effective in the editing. His is the final responsibility for assembling the various sequences of the film as effectively and dramatically as possible. This is an important responsibility. Since the film is, after all, only a series of images, the editor must assemble them so that the scenes are neither too long nor too short and the story assumes a rhythmic flow.

At the end of each day's shooting, the director and editor, together with a chosen few, watch the projection of the scenes taken on the previous day, so that they may have a clear perspective of what they have already accomplished and so the director may select the takes he wants for the editing. If he is not satisfied with certain scenes he must retake them the following day. This procedure continues until all the shooting has been completed. Then the editor assembles the scenes roughly according to the script and for the first time the director and producer will see the picture as a whole. They review it carefully, the director again noting where retakes should be made or scenes

added before the crews and actors are released and the final order is given to demolish the sets.

Now all effects are added by the special effects department, which bridge the time lapses between scenes, and the composer re-enters to score the film and time his music to fit the scenes. All additional sounds are then recorded together with the music, and the picture is ready for a preview at a neighboring theater. This is important because it shows the reaction of a typical audience. Besides, those connected with the production are so close to it that they are no longer capable of judging the picture. A conclave follows the preview, lasting into the small hours of the morning, when the studio staff excitedly discusses the picture in the light of the audience reaction. They decide to eliminate certain scenes and retake others. The picture is finally finished. But there is no rest for the departments: release dates must be met, new stories are waiting, and once more everyone plunges in and starts the same procedure all over again.

Actually, there are no rigid rules or routines for production. Each demands a different handling, each studio has a slightly different organization and methods of production. These methods even vary within one studio for different pictures. For instance, one producer may employ one writer, another several; one director may collaborate with the writer, another may not be called in until the script is ready; one picture may take a year to make, another three weeks; one may need several previews, another only one.

The contributors to this book represent various studios and various methods of picture-making. But all studios and all methods of production are sufficiently similar so that

the chapters as a whole may represent the making of a composite motion picture.

It may be seen from this brief outline that some of the chapters will overlap because several of the contributors are involved in the same processes in the production. For example, the associate producer and director are both present through every step of the production. But their viewpoints are completely divergent: the producer must watch the financial commitments of the film, the predetermined release date and the production itself, while the director is primarily interested in executing the story as artistically as possible. Again, the director, assistant director, stars, cameraman and sound man will all discuss various phases of the shooting of the picture not strictly within their own province. To eliminate the discussion of any one of these contributors would be to eliminate a step in the production.

The chapters are arranged as chronologically as possible. It will be seen from the outline that this is not completely possible, however, because many departments function simultaneously while others enter and leave at certain periods, only to re-enter again when their functions are required. Some departments work on the production only during the preparation, some enter the preparation and leave after the shooting, while still others enter the production during the preparation, such as the music and editing departments, and do not re-enter until after the picture has been shot.

Two additional chapters have been included: one on the color designer and one on the animated cartoon, both developments which bear watching. The arrival of color in motion pictures means a new function in the pattern of production: that of the color designer, who plans and

supervises the entire color scheme of the production to fit the mood of the story. Color is used here like music to heighten mood. But, like the introduction of sound, color will revolutionize the form of the black and white picture. It will establish its own conventions because of the limitations of color photography on the screen. In this way new combinations will be formed. Color in motion pictures will do much to heighten the artistic tastes of audiences.

A chapter on the technique of the animated cartoon has been included because its quality and standards are consistently higher than any other type of short subject produced in America. Its entrance into the feature field will mark a new and interesting departure. The animated cartoon demands a more highly creative imagination than the acted film. Motion-picture makers can learn much from the animated cartoon in its timing, rhythm and sense of movement.

As the reader will see from the previous outline, certain facts become apparent in considering the making of motion pictures. A motion-picture production demands artistry and technical skill. It demands complete co-ordination between all the various artists and technicians who function in its making. It is the most co-operative of all art forms; the work of all the minds which enter into its production must be fused into a unified whole. The one man who plays the most important part in fusing these elements in the production is the director. A good motion picture bears the stamp of his personality and his individual comments on the story. These show not only his understanding of the medium but his understanding of life as well. The artistic importance of the motion picture lies in the interpretation of a single mind.

The director can create and control a world of his own in which all persons and objects conform to the vital pattern as he conceives it. He can place the person and light the object as he wants the audience to absorb them; he can juxtapose their images to achieve new meanings; he can give persons and objects in his world such visual significance that the world beyond the screen takes on new visual significance for the audience. Hollywood films have spent much time in creating an artificial glamour. They have neglected the beauty of very simple things. The motion picture more than any other medium can catch the rhythms and motions of living things. The greater the director, the simpler the basic pattern of the world he creates.

Too many motion pictures lack individuality. In fact, many are so much alike that the work of their directors cannot be distinguished. It may be that directors are not given sufficient leeway in executing their ideas. It may be that it is impossible for one man's individuality to come through in such a co-operative undertaking. But there are a few directors in Hollywood whose work keeps to an individual pattern. Until there are others, the American film will remain standardized.

In the selection of stories, still another defect is apparent. It has become a costly practice of the Hollywood studios to buy successful novels and plays because of their added exploitation value for the screen. Actually, very few novels or plays have ever become successful motion pictures without a great many changes. The studio then employs at least a round half-dozen of writers to transform the successful novels and plays into screen plays. In the course of their transformation, many of these plays and novels must be changed to such an extent that their

titles are no longer suitable and must be discarded—with the result that the successful play or novel becomes a financial burden and loses its exploitation value as well.

Before the ever recurring question of why motion pictures are no better than they are can be answered, it is necessary to consider certain basic facts about the industry. Although many well-intentioned critics have tried to find a formula to solve all its malpractices, too often they overlook the basic facts. It is obvious that motion pictures are far from fully developed and that much still remains to be achieved in the medium. The industry is confronted with its past mistakes which must be eliminated before films can progress. Perhaps the greatest mistake has been the tremendous costs involved in producing films. These developed during the time when studios made a practice of bidding against each other for stories, stars and directors. The more money was spent on a film, the more production value it was supposed to acquire. What really happened was that from this time on, pictures became extremely costly to produce, with the result that now a motion picture must earn a great deal of money in order to become profitable. In other words, it must satisfy two totally different audiences: the large cities and the small towns. A film which is an artistic success in the large cities is almost inevitably a box-office failure in the small towns. If, then, the producers find a formula for a picture which is a success with both types of audiences, they will repeat it over and over again, until the market is glutted with its imitations; even then they will abandon it only with great reluctance.

Considering the cost of production and the two conflicting types of audiences which must both be pleased, how then can motion pictures of quality be made? They

can be made if they are financed on such a scale that they need depend only on the large city audiences. In this way, they need not compromise their standards by having to appeal to small-town audiences as well. Theaters and audiences will have to be specially sought to support these films. Once found, larger outlets and greater audiences can be developed. The major studios would probably not risk such a plan because of their high production expenses. Even if they would initiate it, they would probably have to abandon it because of financial losses. The main difficulty would be the fact that the New York bankers, who lend money to the producers to make their pictures, would hardly support an admittedly unprofitable venture. The alternative method of financing artistic motion pictures would be to have an independent producing unit on a co-operative basis operating on a budget far less pretentious than the average studio budget.

There is a wide field of material open to such a producing unit which has not been attempted by Hollywood. There is the vast country of America to film with its many sections and types of people. Few true films of American life ever come out of Hollywood. When films are made of a few of the Americans who have been important in the history of the country, they are generally distorted. The lives of the vast majority of Americans, living on small farms, working in the mines and the factories, are never seen in the movies. By an honest depiction of American life, such a producing unit can do much to develop what is vital in American culture. It can also afford to experiment in the medium of films. The pattern of telling a story in Hollywood has been so rigidly fixed that it is not easily broken. But it is far from the only pattern. American movies will stagnate very shortly if new patterns are not

established. In this way, an independent producing unit would make a valuable contribution to the motion picture.

If the motion-picture industry were not involved in the financing of thousands of theaters and equipment throughout the country, it would probably find a quicker solution for its evils. But as the industry stands today, all the forces of production are subservient to the controlling financial interests: the actor is guided by the director, who must keep to the formula laid down by the producer, who must in turn make money for the stockholders.

Although Hollywood itself is considerably hampered by its financial problems, it can still make improvements within its limitations. The practice of casting stars in "type" parts should be abolished. This will develop their acting ability and broaden the field of characterization for screen writers, who have always had to base their stories on the physical appeal and personality of the stars. Consequently, neither writers nor stars have been given the opportunity to create characters with a range of emotion or capable of development. The trend of stars to play more varied roles and the fact that actresses are no longer afraid of compromising their beauty, when the part demands it, are both steps in the right direction.

The short subject, which has been sadly neglected during the days of the double feature bill, can be revived and focused upon a wider scope of material which may include: the short story form, subjects which lend themselves to color experimentation, and educational and scientific fields, both of which have been successfully tried out abroad. The short subject offers one of the most flexible means of experimentation in motion pictures.

The writing of original stories can also be encouraged, which will further establish the motion picture as a me-

dium in its own right. Here the field of limited and recurrent stories can be broadened to include a wider, more significant and more mature variety. The abused cycles of light comedies and musical productions can be augmented by social satires and stories which depict some of the problems confronting the world today. Most stories offer a convenient escape from the actual world into a dream world: therein lies their popularity. Certainly a few stories can afford to present the world as it is. The movies are a tremendous source of influence; they should not be wasted.

One achievement of which America can be justly proud is its technical excellence. The men who compose the studio technical crews are craftsmen of the highest order. Year in and year out, the industry conducts tireless research in cameras, lenses, films, sound recording and equipment to improve the technical quality of motion pictures. It is only through the generosity of the producers that such research has been made possible. More's the pity then that the brilliant work of these scientists and engineers must be wasted on films unworthy of production. And more's the pity that such films continue to be made because of the vicious circle existing in the finances of the industry.

Technique is America's contribution to the art. Here is a means of significant expression. Here is a way to enrich the lives of millions with a new vision of the world.

In concluding this foreword, the editor wishes to acknowledge with thanks the real assistance given her during the months spent in Hollywood by individuals in the motion-picture industry who have made this book possible.

WE MAKE THE MOVIES

I

THE PRODUCER MAKES A PLAN

Jesse L. Lasky

THE TERM "producer of motion pictures" applies to the man in charge of production. In his hands lies the supervision of every element that goes to make up the finished product. These elements are both tangible and intangible, the control of human beings and real properties as well as the control of the artistic temperament, the shaping of creative forces and the knowledge of the public needs for entertainment. A producer must be a prophet and a general, a diplomat and a peacemaker, a miser and a spendthrift. He must have vision tempered by hindsight, daring governed by caution, the patience of a saint and the iron of a Cromwell.

In considering the function of a producer as applied to, or rather as dominating, the making of motion pictures, it is well to consider first the term "producer" in its larger sense, that is, the general production head of a major studio. In this sense he is the producer of producers. In other words, he works as the co-ordinating force of functioning producers under him. In his hands are the larger problems of policy and personality, the selection of all executive and widely diversified elements, each one as important to the whole as the smallest spring in the works of a watch. It is largely by him that the product of his

studio is hallmarked. Since he has chosen the workers and inspired and directed them, the product of those workers inevitably bears the stamp of his personality and his mind. Yet the wise major executive understands the artistic temperament enough to permit it to have its way within reason, so that the product bears not only the trademark of the mind of the general producer but contains the results also of the other creative forces that work under him. It is not necessary here to go into the matter of selecting such a studio head. If mistakes are made in such a selection they are soon rectified, because nothing reveals inadequacy of production supervision as much as a finished motion picture. The story may come through as a thrilling and splendid piece of work. There may be gems of acting to ennoble the product. A great directorial touch may breathe some spark of greatness into it, yet, without the co-ordinating personality to fuse these component parts into a unified whole, there is no entity in the result.

Let us then assume that the production head of Imperial Studios has been chosen. This has been done by the financial and executive interests of the picture company, largely dictated from New York. He comes into the Imperial Studios to find it in a chaotic and uneasy state. What will happen under the new regime no one knows. His first duty is to settle this unrest and bring, before confidence and a semblance of order can return, a feeling of security and well-being which is hard to define, but which is as necessary to a studio as finance itself.

The wise producing head makes as few changes as possible. The strength of a major executive in any business, whether it be the cardinal of a church, the head of a shoe factory or the producing head of a motion-picture studio, lies in his ability to choose his under executives. Let us

assume that the new producing head of Imperial Studios has this faculty. Otherwise he would not have been selected. He readily finds, largely because of his complete knowledge of the personalities already in the business, which we shall assume, those weak links which have caused the deterioration in the studio's product and led to his coming into power. These he ruthlessly weeds out, replacing them where he can by the best men he can find. He is then ready to consider the product of Imperial pictures for the coming year and the following years, as long as he shall be in power. Let us assume this has happened in the fall of the year. In a series of conferences with the financial and executive heads of the company, he learns just how much money he will have to spend for the year ahead. If the company owns theaters, as most of the major companies do, he learns the number of pictures these theaters must have to keep their doors open. He acquaints himself with the stars and the featured players available for these productions.

The budget is set as a whole. It is then separated and apportioned by the number of pictures and the money available for them. First, there are the road show pictures, or those pictures with important stories. These are usually based on the best-selling novel of the moment, a great classic of the past, a successful Broadway play or a production idea founded on a trend in history, biography or folklore; such a picture is called a road show because it plays on its first release exclusively in one, and that generally the best, theater in town, at a definitely higher admission. It is also strong enough to stand alone on the bill. Such pictures, even in the largest of studios, will not run to more than two or three a year.

The second classification of pictures consists of those

that are not as outstanding, yet which nevertheless contain one, two, or even three of the studio's stars. These form the bulk and backbone of the studio's product.

A certain amount of money is allotted to what are known as program or, since the advent of the double bill, "B" pictures. These are pictures generally using the studio's featured players and a sprinkling of studio stock company or minor contract players, much like the old stock company system in the theater. Unknowns, in whom the studio sees potentialities, are given their first bath of Klieg lights in these pictures. From these many stars have sprung into the greater spotlight. The budgets of such pictures are limited, their production values are stinted, their shooting schedules are shortened. Here young directors, in many cases recruited from the cutting room or the rank of assistant directors, are given their first chance to function alone. These are pictures that either play the second half of double bills or, in many instances, are never seen in the larger centers of population. If they are, they are played in ten-cent grind houses or suburban communities. Money, too, is apportioned for the short subjects and cartoons.

Once returned to Hollywood, the head of production calls together the executives of the studio: the story editor, the man in charge of writers, the head of production (in this sense is meant physical production which includes the real properties of the studio, such as stages and all actual tangible assets) and, more important, his staff of associate producers. These are his field generals. It is to them he gives his broad orders for the coming campaign and it is up to each one, on a separate front, to carry out the portion of the battle allotted to him.

The wise production head is not content to have in this

This scene from "Mr. Deeds Goes to Town," directed by Frank Capra, represents a bus going along Fifth Avenue. The background was actually shot of Fifth Avenue and then projected on a screen behind the actors when the scene was taken in the studio. This is known as a transparency shot. (Courtesy of Columbia Pictures.)

body of men, numbering eight or ten at the largest studios, all men of the same type. The output of a studio must of necessity cover the entire field of motion-picture entertainment, and the mind and creative instincts of no one man is able to encompass every type of motion picture. Under him there should be realists and idealists, hard-boiled hokum experts and daring experimentalists, experts in the pageantry school of DeMille and adepts in the continental sophistication of Lubitsch. There should be a master of action pictures, able to produce many pictures at low cost with a minimum of material.

Having thus assembled his staff, the producer acquaints them with the facts of his budget and allots to each of them a portion of the year's work according to each one's potentialities. In this meeting, the star list of the studio is considered as well as the stars of competing studios, while the producer plans trades that will bolster up his own product in exchange for whatever trading power he possesses in his own studio. Production schedules are tentatively fixed, budgets allotted to each picture, shooting dates set, directors assigned insofar as possible, and each man is now ready to go ahead with his work for Imperial Studios.

The individual associate producer now takes over his own burden, always, of course, under the alert eye of the production head. But the work of the production head is never done. After all, it is his responsibility to the powers that be in New York, the stockholders of the company, and the motion-picture public of the world, that his product not only be good, but good also in the sense of black ink instead of red at the end of the fiscal year. To do this his decisions must be sure, swift and immediate, as well as subject to change, because conditions change con-

tinuously in the motion-picture industry. A picture set to shoot the next day may be suddenly thrown completely out of gear because of the illness of the star, the temperament of a director or the weakness of the script itself. The producer's resources must be such that no contingency can stop him from finding another star, soothing the director like a super-Talleyrand, or, in an all-night conference in shirt sleeves and heavy cigar smoke, doctoring the script by his own creative power.

The production head of a studio must be alert to changing trends and aware, before the public knows it, of any boredom on the public's part with current picture trends. The web of his mind must be spread over the entire world, alert to feel the quiver of a new personality in a night club in Budapest, a new play by an unknown author in Copenhagen, the next Pulitzer Prize novel before it has even been set in galleys, and the young man running a little theater in Kalamazoo who will, four years hence, make an excellent associate producer. But the most essential of his duties is to maintain the spirit of the studio. Politics and cliques have done more to undermine studio regimes than any other single element. The production head cannot carry water on both shoulders so that his associates can view the act. If double water-carrying is to be done, it must be done in private with care. The production head of a studio must be a strong man, and a man willing to be hard when softness would be the easiest way.

Let us now consider the associate producer and the way he functions, from the selection of story material until the night of the preview of his picture. At the heart of all picture-making lies the selection of the story itself. This may come from a number of sources. It may be a novel purchased before or after publication from the publisher

or author. Its price, as are all story prices no matter what the material, is based on the demand for the specific story. If a number of studios have been interested, the price has been heavy. If the story is one that has escaped the eye of most story departments and producers but not the eye of our alert producer, the price has been considerably less. The story material may be a play, already produced on Broadway, in which case, according to the producers' code, all production companies have had an equal right in bidding. For, even though one company has financed the Broadway production, that company has no inside track for its screen purchase except the privilege of meeting the highest offer of any other company. Generally, in the purchase of a Broadway play, the film production cannot be made until after the Broadway run is exhausted. If it is an unproduced play, the writer in most cases sacrifices a production chance, since once the play is made into a picture it seldom reaches the stage as a play.

The material, and this has become a great part of story sources in the last few years, may be an original story; that is, one written especially for screen production. The writing of such material is a very special art and such stories are generally written, if a sale is to be hoped for, with great attention to possible shots and final screen-play construction. Or the material may be a special production idea of the associate producer based on the need of some special star, a biographical or historical character, an idea in the progress of civilization, science or invention, or a definite historical period. In such case, a writer must be hired who is especially acquainted with the subject matter at hand and especially adapted to make a picturable story from such material.

It is the custom now, in most studio story departments,

to issue a weekly bulletin compiled partly from material covered and made into synopsis form in New York, and (this is true mostly of original stories) partly from material submitted in Hollywood to the story department by agents or writers themselves. These bulletins cover the outstanding material of the week, number anywhere from five to ten stories and are sent to every associate producer for perusal. If any of these stories appeals to him, he puts in a claim for it and, if the deal is O.K.'d by the studio head, it is purchased for his production.

The severest problem of associate producers is to find special material for highly specialized and typed stars. There is a certain market in Hollywood at all times for stories for such personalities as Dietrich, Arnold, West, Raft, etc., and the surest way for a story sale is to definitely aim at such a permanent need. One of the most difficult of all stars' needs to fill are stories for singing stars such as Grace Moore, Martini and Lily Pons. Because the public has long since tired of success stories starting with Cinderella, male or female, and ending at La Scala or the Metropolitan, stories are always at a premium which enable a star to sing without stopping for a curtain to go up or an orchestra conductor to rap with his baton.

The associate producer now has four or five stories to put into work at one time. The first step is the hiring of a writer to make what is known as a *treatment*. A treatment is an intermediary step between the raw material of the story and the screen play or *shooting script*. It is briefly that pattern on which the picture is based so that unpicturable matter in the original story is refined or changed, so that the camera may catch it and make it understandable to all. It is written in the form of an

ordinary short story with sufficient dialogue suggested to follow the story line.

The producer has two sources of writers: those under special contract to the studio itself, and free-lance writers who have no studio contracts but are free to work at different studios on special assignments. The associate producer must have an intimate knowledge of the strength and weakness of all Hollywood writers, because the picture-writing field is highly specialized. Writers are bracketed, and justly so, as specialists in their own line. The appropriate writer is then hired and given the story material or the production idea of the chief.

After a story conference, in which the producer imparts to the writer his ideas for the treatment of the story, he proceeds to mold it into shape. When this treatment satisfies the associate producer, the next step is the screen play itself. This may be assigned to the writer of the treatment or, in most cases, to another writer who is a specialist in screen plays. As many as two or three writers may now be put on the screen play, one an expert in construction, one a specialist in the particular type of dialogue required, and perhaps a continuity writer or one qualified in camera shots and camera transitions.

The associate producer must keep complete contact with these writers at all times. He must be aware of every step they take, he must hold in his hands the story reins, and know which one of the team is not pulling his weight or holding up his end. He must be quick to make changes in such cases, since the production date has been set. There is nothing more disastrous than going before the camera with an incomplete or unsatisfactory script.

By now the associate producer has many problems besides story problems. Casting the picture is one. Since he,

and probably he alone, is familiar with each character in the story from the hero and heroine to the least bit player and since, in his mind, these characters have assumed life itself, it is necessary that he himself select the actors to play the parts. Of course, this is done with the co-operation of the studio casting office. But to most studio casting offices the story is only a story, whereas to the associate producer it is as if he were a minor deity creating a new world and peopling it with Adams and Eves and Cains and Abels. This casting occupies a great part of his waking hours. His sleeping hours are interrupted by night story conferences.

When the first screen play is completed, and it generally runs overlength (the length of a non-musical may run all the way from 125 to 175 pages; a musical somewhat less to allow for songs), the copy is sent to the production department and an estimating script is made, based on the stars and directors involved, writing costs, including original material, production expenses and all other items which go into the making of a picture, to the last detail. This cost must approximate as nearly as possible the original budget assigned to the picture. If it does not, the script must be pared to eliminate scenes that run into excessive cost, or the associate producer, with the touch of the Blarney stone or an iron hand, must wheedle out of the studio head the necessary money to proceed with the picture in the manner indicated by the script. The estimating cost and the money available now tallying, the producer must find time to consult the art department, inspect sketches for the sets, go into conclave with the costume designer, see the music department and consult there about the score. If the picture is a musical, this becomes doubly important. In fact, the producer must transform himself into a man of many professions: dressmaker, artist, musician, writer, star-maker

and, above everything else, diplomat and peacemaker.

He must find time to look at tests. This is experimental film taken of candidates for the various parts, either using lines of the script or quite extraneous material, through which he must judge the fitness of the applicant for the part. In musical numbers the music, both vocal and orchestral, is in most cases *pre-scored*, that is, recorded first on the sound track without the camera, and then dubbed into the finished negative after the particular scene has been shot silent. This gives better recording of musical numbers. Before this, however, songs used in the picture which have already been used in other pictures or musical stage productions which are not new, must be cleared, that is, payment must be made to the owner of the copyright for the original usage. Sometimes this is highly involved, as in the case of foreign copyrights. Songs that have been written especially for the picture must be arranged and orchestrated.

In most cases the director works with the producer and the screen writers on the script. This insures complete coordination between script and the direction.

The final shooting script is now ready. The cameras are ready to grind. But before production starts, the finished screen play must be submitted to the Association of Motion Picture Producers, which examines it for censorable matter or for anything that might offend the authorities in foreign countries as regards the politics, religion or customs of the country in question. Many of the separate states have special points on which the state censors are particularly strict. The Hays office thoroughly understands such restrictions and it is most wise to follow, as far as possible, any strictures they might raise concerning such points. The screen play is returned to the producer with

exceptions noted. These are changed and the picture is ready for shooting.

The first day of shooting is over. This may have consisted of scenes from the end of the picture, since it is not shot chronologically. But, for convenience, the scene order is dictated by the availability of stages, sets and actors, some of whom may have been borrowed from other studios and are under pressure to return to their home lots to fulfill commitments there.

The next morning, or whenever convenient the next day, the associate producer and the director view the *rushes*. This is the term for all the takes of the previous day's work that the director, from his angle on the set, has considered sufficiently satisfactory to have printed for his own and his master's eye. There may be as many as ten or twelve takes of one scene from different angles, distance and moods. The producer, with the co-operation of the director, must select those shots to be used in the finished picture.

One must remember in detailing the separate steps through which the associate producer passes to make a picture that, in all probability, he is at work on three or four other pictures in different stages of production. He must change from hour to hour in mood, character and personality to carry the newly arising problems in every detail of this manifold schedule. The wise associate producer leaves his director alone on the set except where the director is patently wrong, but otherwise undue interference is apt to be fatal.

The *shooting schedule* has run its course, all scenes have been shot and every angle has been protected by the director, that is, covering shots in long shots, close-ups or medium shots have been made to obviate retakes as much

as possible. The negative, by now probably four times overlength, is ready for the cutting room. Here it goes through the process known as editing, wherein the director and the cutter, or film editor, under the supervision of the associate producer, fit the jigsaw pattern of takes together, eliminating many scenes, where necessary for footage, and very often switching scenes around from the original shooting script for story clarification. This is a long, laborious and exacting task, and a most important one.

The edited picture is now shown to the office of the Association of Motion Picture Producers, and again this office notes those things that might mitigate against release in certain states or lead to banning entirely in certain foreign countries. If changes are necessary they are made; the picture is again shown to the Hays office and, if satisfactory, a Code Certificate is issued. It is then ready for release.

The publicity department is called in and given a view of the rough cut so that they may form the basis of their publicity campaign. Certain pictures may have acquired new exploitation values during the shooting, or pictures from which little was expected in the beginning may have assumed new importance because someone or some element caught fire in the creation. These things must be visioned by the man at the helm and he must convey this fire into the minds and spirits of the publicity and sales departments so that they in turn believe in this product as much as he does himself.

Now the trailer must be prepared. This is that brief bit of picture used as a teaser or bait to motion-picture audiences the week or two weeks before the picture is to appear in the house using the trailer. It is composed of the

most interesting and colorful parts of the picture, but must never reveal the story or detract in any way from the suspense of the picture itself. It must show not too much but too little, so that the audience will greatly desire to see the picture itself.

We hope that by now the title of the picture has been finally set. If not, all the publicity sent out by the publicity department during the shooting has been largely wasted. Yet, in many cases, the exact title is not set until the final editing and is often a source of considerable difficulty at this time. Then, too, credits must be assigned for the picture. By this is meant those acknowledgments at the beginning of the picture designating the individual in each department who is responsible for the finished picture. This is often a source of considerable bickering, since as many as seven or eight writers may have had some share either in the original treatment, screen play or additional dialogue. But since the advent of the new Academy code a definite procedure for such assignments has been established—which is too technical to explain here.

Now the picture is ready for a sneak preview. By this is meant the custom in Hollywood of taking a rough cut to one of the neighborhood small towns without any previous announcement either to the press or to the general studio personnel. Here the picture is shown before a typical motion-picture audience, away from the critical and highly technical studio minds. By this means, the studio executives hope to gain some indication of the public feeling for the picture. It may be previewed as many as three or four times. Changes are made in the meantime, eliminating what seems dull and bringing into prominence those scenes which have received the best reaction. Perhaps the producer decides that it is necessary to shoot

certain scenes, which were not in the script, for the sake of story clarity, or perhaps it is necessary to shoot other scenes of which no satisfactory takes have been made. In this case, the sets are redressed and the actors recalled.

The picture is now in such shape, we hope, as to permit a preview at a Hollywood theater to which the members of the trade press are invited. The associate producer now awaits the reviews of the *Hollywood Reporter* and *Daily Variety* which appear the next morning. Then he must await the verdict at the box office, but he does not wait idly. The finished motion picture is a collective artistic endeavor; it bears the signatures of perhaps ten artists, each of whom has contributed something to the whole. Yet the most important signature of all is the one least noted, the signature of the associate producer who has fused a thousand elements into a unified whole for better or for worse.

II

LOOKING FOR A STORY

Samuel Marx

THE TASK of finding a suitable screen story is as difficult as any in all Hollywood, where practically everything done is impossible.

Hollywood is an incredible, mythical kingdom. All you hear about it which you can't believe is true. Very probably you can't believe that it's hard to find story material to film. But it's true.

The larger studios comb through twenty thousand stories a year in order to find fifty. The twenty thousand are the better magazine stories, foreign and American plays, novels published throughout the world, and stories created directly for the screen by authors of known reputation. From these sources the studios find twenty thousand pieces of material to consider. They do not always find the fifty stories to film.

Merely collecting this voluminous mass of literary material demands a world organization of great proportions. Story scouts are stationed in the important capitals of Europe. The recent rise of English film production has forced American film producers to spring into action when a likely English play appears. Hollywood is thousands of miles away. But the curtain hardly begins its

descent at the première before details of the plot are on their way to Hollywood.

In our own country, New York City still remains the happy hunting ground of the Hollywood story departments. Magazine and book publishers have not been lured West by climate or gold. Play producers, battling against great odds, have maintained Broadway as the theatrical center of the world. There will always be important plays and books appearing in New York, about which little has been heard in advance. So a staff of editors and readers comb the Manhattan creative marts, and their findings, together with the findings of London, Paris, Budapest and points east, come to the desk of the studio story editor. Out of this endless parade the overwhelming majority of stories annually land on the shelf. But a few will be chosen for the screen. Let's go with these to Hollywood and see what happens next.

The story editor is entrusted with the task of sifting the stories, selecting the possibilities, eliminating the impossibilities. Because he is physically unable to read every submission in its entirety, a corps of readers reduces the basic material to synopsis form. The New York office maintains a staff of these readers; the studio employs a complete department of readers, sometimes numbering over a dozen. A competent reader reduces the elements of a story plot to a synopsis of from one to twenty pages, briefly adding his own opinion of its celluloid possibilities.

Stories dealing with miscegenation, dope, capital and labor difficulties, racial questions, sensational sex problems and subjects likely to arouse international disfavor, may all be dismissed at first glance. It isn't that the editor would have it so. Neither would the producer. Often, when story material reaches its low ebb, they yearn for

the right to dare one of these forbidden properties. But censor boards are watchfully waiting; governments cannot be cajoled; and millions of dollars may be lost in the effort. The story editor tosses the tempting morsel aside . . . picks up the newest variation of Cinderella, The Ugly Duckling, The Sleeping Beauty . . . waits, as he reads, to see if boy meets girl, or girl meets boss, or boy meets football team.

Just as he knows what is taboo, so the editor keeps informed on what he needs. Stories must be bought well in advance if they are to be converted into scenarios. The studio has expensive stars under contract, each possessing an individual talent and a comparatively short professional life. The story must not be too similar to the star's previous pictures, yet within the realm of the star's capabilities. It cannot differ too much from the star's successes because the public does not like to see the star in an unfamiliar type of role. It is when a star appears in material perfectly suited to what the public wants, that a "box office success" emerges.

A good editor knows he cannot make rules about stories. Editors who live by rules always have to change them. Films about Hollywood were long considered undesirable. *Once in a Lifetime*, *Bombshell*, *What Price Hollywood*, all excellent, proved to three separate companies that this was a good rule. The public didn't want stories about Hollywood, they said, and repeated it right up to the day *A Star is Born* began breaking records. So the editor, if he is wise, eliminates these prejudices from his judgment and delves into his weekly collection of possibilities.

Not all stories are written on paper. A new problem has arisen in editorial life. Not only must he be able to read, the story editor must now be a good listener, too. Estab-

lished screen writers have begun to show a preference for "telling" their stories instead of writing them. They claim that in this way the studio can determine any changes needed before the indelible words are placed on paper.

This new way of presenting original stories is partly due to an otherwise industrious young man named Norman Krasna, who told the plot of a play he intended to write to a few people around Hollywood. He called it *Mob Rule*. He never wrote the play, because Metro-Goldwyn-Mayer purchased his verbal manuscript and produced it as *Fury*. Ever since that day Hollywood writers have been telling stories like fury.

Mentioning Hollywood writers seems to call for one paragraph, at least, on such an interesting subject. When talking pictures arrived, a little less than a decade ago, writing was a necessary but inconsequential evil connected with making movies. Anybody who owned a pencil could be a writer then, and unless he wrote titles he didn't need to know how to spell. Talkies changed that, and as producers educated the public to want better scenes and dialogue, they found it necessary to meet that demand with finer writing. The result has been an increasing array of the best writing talent in the world in Hollywood. Some of the older writers have weathered the silent era and the sound, and moved ahead with the times. Some writers are best at story construction. Some writers are best at dialogue. The story editor grows to classify their abilities; he must know on whom to call for a particular specialty. The best Hollywood writers, however, are those who can supply all the requirements of writing a screen play, and turn in a completed piece of work.

Formerly there was a hue and cry in the land if a well-known book or play reached the screen in form different

from the original. The screen was too prone, its critics said, to change plots in the course of translating them to celluloid. We rarely hear the complaint today. It isn't because the screen changes less. The screen today may change plots legitimately. The writers working in the story department at Samuel Goldwyn's include Anita Loos, Lillian Hellman, Dorothy Parker, Donald Ogden Stewart, Sidney Howard, Robert E. Sherwood and Ben Hecht. These screen playwrights are generally superior to the material available for them to work on, and any changes made by them are likely to be for the better.

All pictures are dependent upon ideas. Millions are invested in nebulous ideas. As story editor of Metro-Goldwyn-Mayer, it was my daily routine to advise the late Irving Thalberg of new literary ideas throughout the world. In his office, late one evening, I casually mentioned that an interesting play had appeared in New York the previous night, and I had wired East for the manuscript. I added that I knew vaguely that it concerned a World War soldier whose wife disappeared following an enemy invasion. Years later he finds a woman who looks like his wife, but she denies her identity although she tries to be everything that the other woman was to him. At no time does he or the audience ever learn whether she was his pre-war wife or not. Thalberg was ready to leave his office but he stopped, picked up the phone and called an M-G-M executive in his New York home.

"They're asking fifty thousand for the film rights," said the executive.

"Buy it," said Thalberg, and went home.

The play, *As You Desire Me* by Luigi Pirandello, proved one of Garbo's biggest hits. In this case, of course, Thal-

Part of set showing New York tenements used as a background for the story of "Dead End." The section of the skyscraper in the background is a large photomural. The set is lit from above. (Courtesy of Samuel Goldwyn Productions.)

berg knew an entire playscript had been written around this idea. He wasn't buying an unwritten notion.

The Hollywood story editor has not the power to buy whatever story he likes. As you will learn from other chapters in this volume, movie-making is a matter of teamwork. In each and every phase of the translation of printed matter into celluloid, hand in hand co-operation is necessary. The finest pictures invariably result, not from individual efforts, but when all individuals are functioning as partners. The story editor, then, is really the selector of the material which is to be considered, and the studio trusts him to eliminate whatever is unworthy. But when it comes to deciding what should be bought, story editors consult producers, directors, stars and writers.

As an example of how stories are bought, let us consider the purchase of *Grand Hotel,* one of the great screen properties of its time. Kate Corbaley, the assistant story editor at M-G-M, has occupied this position through the regimes of half a dozen story editors. Every man who has worked as head of the department readily admits that her inexhaustible knowledge and indefatigable capacity for reading supplies the strength of the department. One day she came to me with a theatrical news clipping which stated briefly that Reinhardt had produced a play called *Menschen Im Hotel* in Germany, and it had been a quick, decisive failure. The clipping said that, as the title indicated, the play dealt with different forms of humanity passing through thirty-six hours in a modern hotel. Mrs. Corbaley thought that, in spite of its failure, this was an interesting movie idea and we ought to read the play.

This play by Vicki Baum arrived in German, so I passed it over to a contract director named Paul Fejos who could read the language. He was looking for a story to direct,

and was most enthusiastic about the German play. He told us the story and we decided to buy it. That was where an obstacle arose. A New York merchant named Harry Moses had been traveling in Europe that year and happened to see the play at Reinhardt's Theatre during its brief run. Anxious to dabble in theatricals, he had purchased all rights for five thousand dollars. He was summoned to the M-G-M office where he refused to part with the film rights, because he wanted to produce it as a play himself. Finally he thought that if M-G-M wanted to share the cost of the stage production with him he would turn over the movie rights to them, also returning their investment from any profits which the play might show. This information was conveyed to the studio. It was estimated that the play could be put on for twenty-seven thousand dollars; the film company and Moses were each to put up half. It was agreed.

The film company was pleased to get the film rights, but thirteen thousand five hundred dollars was a large investment and there was some talk of safeguarding it. After all, Moses admittedly knew nothing about show business at that time. So the company demanded that Moses affiliate himself with some tried stage producer. He went touring Broadway one night, stopping in to see an impressive melodrama called *The Last Mile*. The producer was Herman Shumlin, whom he asked to participate in *Grand Hotel*. He was willing. The play became a world sensation and M-G-M owned the movie rights without cost.

I have already explained why I feel Hollywood has the right to change material it has bought and paid for. Story conferences take place immediately after a book has been purchased, or when the screen play is complete and needs

revisions, and sometimes even when the film has been shot, but requires retakes. Sometimes an entire story is thrown out after a story conference. Sometimes a studio staff spends days trying to find one appropriate line and sometimes story conferences are held without writers. The producer and the director are often more practical than the writer. Silly as it sounds, most producers will understand what their harassed colleague meant when he said, "Writers only clutter up a story conference!"

I have already mentioned some of the taboos which story editors must keep in mind. At one time movie producers were prone to offend good taste in respect to sex stories. That this has ceased is due in a measure to public objection. The most important taboo today condemns the story which may arouse political displeasure. Predicting the reaction of a remote censor in some far-flung corner of the earth is not easy. Peru banned that excellent document, *The Informer,* because it showed rebellion against authority. Yet the film was passed in Hungary, where censors banned *Green Pastures* because it might mislead Hungarian minds with respect to religion. The Peruvians who were deprived of *The Informer* were permitted to see *Green Pastures.* Two high spots in censorial insanity occurred when a Japanese protector of morals banned a Betty Boop cartoon for reasons unknown; when Poland deleted the lyrics of *Ol' Man River* from *Show Boat* because they implied class struggle.

The film producers are being faced with two alternatives as a result of this kind of censorship. They can accept all rulings and simply lose the revenue, or they can fight. So far they have chosen the first alternative, which is a practical although regrettable choice. The more leeway the censor is given, the more he wants.

Some of the examples quoted above show the folly of political censorship and why it must be combated. Turkey has forbidden production of Franz Werfel's great document on intolerance, *The Forty Days of Musa Dagh.* Here is a good test case for the coming war against censorship. Turkey alone cannot fight against the production of this film. The total film rental from all the theaters in Turkey hardly equals one good week in a Broadway first-run house. So the Turkish censor cannily won the consent of the diplomatic representatives of nations friendly to Turkey in banning the film if it should ever be produced. Although the would-be producers pointed out that the book dealt with Turkish authorities no longer in power, it was of no avail. A Turk, apparently, is a Turk, even if a revolution has destroyed him. To date, Turkey has won its quarrel with Hollywood. The scenario of *The Forty Days,* complete and ready to shoot, gathers dust on a shelf.

To circumvent the extravagance of purchasing stories which cannot be filmed, Will Hays' Association of Motion Picture Producers formulated a Code of permissible action. This Code is not infallible; it cannot guarantee a picture against censorship such as that which stymies *The Forty Days.* But it contains valuable instructions calculated to reduce censorship troubles. The Code strives to maintain correct standards of morals on the screen; fights any tendency to audience sympathy for crime or sin. Because of this code, you are not likely to see close-ups of death, pictures dealing with dope, sexual perversion or nudity, or themes ridiculing worthy endeavors.

Studio members of the Association also submit questionable new books and plays to this office before purchase. In addition, the Hays office covers each première in

Manhattan and reports censorable probabilities in connection with these new plays. Sometimes they pass material with the implication that their word is not final and should be submitted elsewhere. Such was the case with an amusing novel entitled *L'Affaire Jones.* The plot of the story concerned itself with the excitable French temperament; how a shy American tourist, involved in a boulevard argument over an umbrella, caused an enormous national scandal. The Hays office had no objections to filming this story, provided the French had none either. They recommended that the studio submit the book to the French Consul in Los Angeles. He promptly turned it down.

An effort by a studio to find some way out of a Hays ruling led to a disastrous suit for plagiarism rather than serious censor difficulties. The suit was a disaster for the studio, which wanted to do *Dishonored Lady* with Joan Crawford. They felt the character admirably suited to this star. But the Hays office banned the play from the screen, because it showed a young woman literally getting away with murder. This play was based upon an actual murder case which had occurred many years ago in England. It had served as a subject for many authors, and this time was treated by Mrs. Belloc-Lowndes under the title of *Letty Lynton.* Because the novelist handled her subject differently from Margaret Ayer Barnes and Charles Sheldon, the playwrights, the studio was permitted to buy the book. They were sued, and the courts ruled that the studio had helped itself to ingredients of the play.

A great menace to the production of motion pictures is the plagiarism suit. There is hardly a film released which is not the target of unscrupulous literary sharpshooters. Shysters constantly plague the film companies, hoping for a settlement made out of court for sheer nuisance value.

Most of these unfair cases are thrown out immediately by discerning judges, and studios have found some relief since plaintiffs are assessed all costs of unsuccessful suits. But, due to real or fancied grievances, each film is sued for new or strange reasons. The first picture depicting *The Thin Man* contained a scene in which the players were halted at every tree and post by an inquisitive dog on a leash. This bit of business prompted a lawsuit by an amateur author who felt he had described such action in a story which he admitted was nothing like *The Thin Man.* The film company which produced *Wife vs. Secretary* was sued by a magazine illustrator who claimed he recognized one of his illustrations framed on the wall of an office set. The illustration was out of focus, could only be recognized by the artist himself, yet he sued for fifty thousand dollars' damages. As the world knows, the producers of *Rasputin and the Empress* paid Prince Yousopoff one hundred and twenty-five thousand dollars as the result of a verdict in the British courts. Yousopoff successfully contended that he actually was the prototype of a fictitious Prince Chegodieff in the film. Yousopoff's check had hardly cleared the banks when the producers were sued by a Prince Chegodieff because he never did any of the things depicted by the film actor.

You can see, therefore, why studios have some right to be hesitant in dealings with the outside world. Every story accepted for consideration is potential dynamite, capable of exploding without warning in any courthouse. Tremendous honesty is demanded of the studios by individuals who may have no personal standards of honesty whatsoever. By dealing with produced plays and published books, all manner of witnesses are available to testify re-

garding story points. When an amateur submits an original manuscript, it's the word of one man against another.

Because I feel that the motion-picture industry needs the ideas of creative individuals regardless of their professional standing, it is my intention to be encouraging in spite of the gloomy examples already described. It is possible that readers of this book may want to write stories for the movies, so I'll complete this chapter with a few observations on that interesting possibility.

Fifty thousand dollars was quite a sum, six years ago, when *As You Desire Me* was purchased. But as this article is being written, Radio Pictures are making out a check to the authors of *Room Service* for two hundred and fifty-five thousand dollars.

Plays have always cost the studios most money; always will. The reason is obvious enough: of all types of material the playscript most approximates the scenario. In this past decade, dialogue has become the most valuable ingredient of the screen story. Plays contain relatively most dialogue; hence plays are more desirable than novels and originals.

For this same reason, plays have lately composed the bulk of material purchased for the screen. Studios avidly read all plays, usually regardless of whether they have been produced on the stage or not. However, in studio estimation, a produced play is of greater value to the screen than an unproduced one. This is because the play has received public approbation and, as in the case of a success like *Room Service*, it warrants the expenditure of a huge sum for the right to film it.

There is an example of motion-picture studio judgment in connection with this. A play called *Home, James*, by A. E. Thomas, was tried out at Netcong, New Jersey,

and I advocated its purchase. The author was willing to drop its Broadway chances and sell directly to the films for fifteen thousand dollars. The studio decided not to buy, so the play went on to become a Broadway success shortly afterwards under the title *No More Ladies*. The studio promptly bought it for sixty-five thousand dollars. They were quite unperturbed that this delayed decision cost them an additional fifty thousand dollars; they felt the public approval of the story was worth the difference.

The original screen story has ultimately to come into its own as a source of screen material. That this has not yet occurred is due mainly to the writers rather than the studios. Writers are too prone to write "down" to the screen—fail to approach original screen material with anything like the reverence they have for their book and play outlets.

But these original stories, written directly for the screen, continue to gain ground as big movie hits spring from them. In recent months outstanding films like *The Life of Zola*, *Libeled Lady* and *Lloyds of London* have done much to impress the producers with the possibilities of originals.

It is not difficult to write for pictures. Furthermore, the demand for stories is far greater than the supply. Here is one market still untouched by the depression. But a great deal depends on the manner in which this market is approached.

When a writer wants a book published (at an approximate cost to the publishers of five thousand dollars) he writes the whole book. When a playwright desires a play produced (which will cost Mr. Producer something between a thousand and twenty thousand dollars) he first writes the whole play. But men and women who think they can write movies (costing upwards of one hundred thou-

sand dollars) try to dispose of their wares by putting the idea down on the back of a postal card. This is hardly an intelligent approach.

True, movie producers boil stories down to a mere outline when the real work of adapting material to the screen begins. They want a comprehensive treatment of the story. This motion-picture treatment contains the elements necessary for the sound microphone and camera. It excludes all elements which the camera cannot film, the microphone cannot record. Frances Marion, ablest of scenarists for many years, never attempts a treatment under a hundred typewritten pages. This is also true of her original stories for the screen, of which you will surely remember *Min and Bill*, *The Champ*, or *The Big House*.

I can hear your question already. Suppose I write my hundred-page original story. What do I do with it?

While it is true that Hollywood studios usually turn heartless backs on the neophyte, the story editors have been known to accept material if the writer presents a good case. Write your story, then drop a note to the editor of the studio to which you believe the story is best fitted for production. It may be they possess a certain star you visualize for the story. It's quite possible that the editor will accept such a story when he won't accept a brief outline. Flaws in construction, formlessness, or lack of theme, can often be glossed over in an outline, so the studio refuses to consider such material from the amateur. But in a well-developed piece of material there may be elements worth consideration. The editor may break his rule. It could happen. It has happened.

If it fails in your case, there are reputable literary agents in Hollywood and New York who will accept material from new writers and consider it. They can submit it to

the studio. Don't try to break into scenario writing by joining some correspondence school which claims to open an inside track for you. In the seven years I have helped purchase movie stories, I have never bought one from a scenario school pupil. In fact, I have never knowingly read one.

There are some practical rules to be observed in writing for the screen. Remember you are competing with the world's output of fine literature and dramatic material. Therefore don't try to write ordinary material, believing that because it resembles movies you have seen it stands a good chance of being bought. The opposite is true. It stands no chance at all.

If your story is to attract the producer it must be fresh material, off the beaten track. Originality of theme is definitely Rule Number One.

New backgrounds are always desirable in movie material. Background pictures have always been interesting and generally successful. By background pictures I mean *Dead End*, which deals with an unusual section of New York; *Roar of the Crowd*, which deals with pictorially exciting auto racing; *Captains Courageous*, with its extraordinary fishing life. Against these backgrounds a playwright, scenarist, and novelist, respectively, juxtaposed interesting characters in keeping with the locale. So let's call the selection of a fine photographic background Rule Number Two.

Rule Number Three is important from a practical standpoint in selling your story. Write your material for a typical movie star rather than an unusual one. For instance, M-G-M has its typical star in Clark Gable, Samuel Goldwyn in Gary Cooper, Paramount in Fred MacMurray, and Warner Brothers in Errol Flynn. These stars represent the romantic American type. If you fashion your story for this

type of actor you have a story which can reasonably be submitted to any studio. But if you write a story suitable, let us say, to George Arliss, you will have trouble selling it anywhere, once his studio rejects it.

There is one rule which I am forced to give to all who ask how to become screen writers. It is a rule to be remembered, instead of seeking advice. It should be recalled while waiting for inspiration. It is the most important rule of all. It is, in a word, WRITE!

III

THE STORY GETS A TREATMENT

Sidney Howard

IF ONE goes to the root of the matter, motion pictures are neither written nor acted, but made. It is the combination of director with cameraman which, more than the writer, more even than the beloved screen personality, gives the finished picture its life. Apart from the original story material, the writer's function in the making of pictures is a secondary one. Since the screen as we know it draws the vast bulk of its story material from books, periodicals and the stage—with a few imaginative excursions into biography—the screen writer's task is really a job of adaptation hack writing, cut to the dimensions of the director's demands. The screen does not yet ask of its writers much more than technical ingenuity. The present purpose is to describe and to discuss the screen writer's share in picture making, but it seems as well to admit forthwith that there is no immediate likelihood of literature on celluloid.

The process by which the screen adaptor goes to work is in itself designed to cancel out inspiration. Let us suppose that Mr. Sinclair Lewis has written a novel in which the picture studios see possibilities. The supposition is a reasonable one, because Mr. Lewis frequently does write novels and the studios are apt to covet them. The selection

of Mr. Lewis's works to illustrate this chapter makes its writing the easier for me, moreover, because it has been my good fortune that I have on three occasions served Mr. Lewis as a screen adaptor, and much of my motion-picture experience derives from my work on *Arrowsmith*, *Dodsworth* and *It Can't Happen Here*. For our purpose, however, Mr. Lewis has written a new novel and his agent has sent it to the New York offices of each of the different studios.

Immediately on its receipt by each office, the book, manuscript or slather of galley proof will be turned over to an exceedingly overworked employee known as the reader, who will personally conduct its first faltering leaps towards the screen. Mindful of the fact that most picture executives are busy, busy men who would not be given to reading under any conditions, the reader proceeds to reduce Mr. Lewis's work to a brief and inevitably inadequate synopsis, embodying the high lights of the story, any morals pointed, remarks on the likelihood of its popularity, and adding his own critique in which, the book being Mr. Lewis's, he almost certainly recommends buying the picture rights. Then ensues a period, of intense interest to any man of Mr. Lewis's literary attainments, during which the different studios compete with each other in offering large sums of money for the motion-picture rights to the preceding six months of the novelist's life.

The period of competitive bidding terminated, Mr. Lewis disappears from the arena. Economically he is better off than when he entered it. Artistically he is much the same. A book is a book and a picture is a picture, and Mr. Lewis will not again be given a moment's thought by anyone until, three days preceding the picture's release, the studio publicity office remembers that he won the

Nobel Prize and invites him to a private showing of the picture in exchange for an endorsement to the effect that the picture is ever so much better than the original novel. I may remark in passing (and from experience) that Mr. Lewis is afflicted with a kindliness towards his stage and screen adaptors which amounts to an aberration as yet unnamed by psychiatrists. The screen hack (or adaptor, as we prefer to be called) begins his labors immediately after Mr. Lewis's first payment has been handed over.

He may begin in a variety of ways according to his position in Hollywood's slant on the writing craft. If he is what is known as a New York writer—that is a term employed to cover all writers who are not residents of Hollywood—he will be summoned to interview an important metropolitan executive who has not read the book, may have glanced through the reader's brief synopsis, but is expert at conveying-the-impression with just the suitable amount of literary enthusiasm. Arrangements being concluded between the executive on the one hand and the writer's financial obligations on the other, the first discussion of the screen version of Mr. Lewis's latest terminates in an argument over whether the writer shall fly to Hollywood or take the train. The New York executives of studios almost invariably, I have found, advocate flying for writers, though very few of them would think of flying themselves. They are all husbands and fathers. So are a good many writers, and poor sailors to boot. The major consideration, however, is always the pressure of time. The picture—so the writer is told—must be ready for production in virtually no time at all. Wherefore, and not knowing that he has a year and a half to spare, he boards the overnight plane to Los Angeles, there to report to a producer who probably is too busy with golf or the races or

his favorite endocrinologist to see him during the interval between his arrival and his first two or three weekly salary checks. This interval the writer will employ in thinking how he will spend his salary and making sure that his studio office is equipped with all the supplies he would never dream of buying for himself. He may even reread Mr. Lewis's novel.

All screen writers, however, are not New York writers, nor even high-salaried members of the Hollywood studios' literary staffs. It is just possible that the studio which has bought Mr. Lewis's novel may have no immediate plans for it. Every studio has on its pay roll a group of so-called "younger writers," ranging in age from eighteen to sixty, who draw very small salaries, sit in very small offices and, because they have not acquired a thing known in Hollywood as "prestige," waste their lives in the process of being "broken in." It is not impossible that Mr. Lewis's novel may pause for a time to further the "breaking in" of one of these mute, inglorious Miltons. Here it will be developed into a full-length motion-picture script which no one will ever read. Inasmuch as this step in our story is almost invariably a dead end, we may, as the studios do, proceed, as though it had never been, to the day on which our New York writer has been called to his first story conference.

I am aware that a great deal of fun has been poked at Hollywood story conferences and that most of it has now grown stale. It must be obvious, however, that the first story conference is an essential milepost in the screen writer's contribution to the making of the picture. It is then that he tells the producer and the director the story of the picture which the one is to produce and the other to direct. I have often thought that this constitutes the

most important function that he has to perform, because directors and producers are notably reluctant readers.

Our hypothetical story being the work of Mr. Lewis, neither director nor producer has any fault to find with it—yet. In fact the first story conference is almost certain to end on a note of amiable optimism. The writer has a great angle on the material, the director is going to do a great job of direction, the star is going to be great in his or her role, a great picture is going to be made. The writer retires to his office and office supplies to write what is known as the treatment.

Now the treatment is a description on paper of just how the screen writer plans to make Mr. Lewis's novel into a picture. He will by this time have made himself so familiar with the book that he knows it better even than Mr. Lewis, who forgets his own books with a happy alacrity. The writer may employ two or three styles in the writing of the treatment. Many, I have noticed, go in for highly colored expression and become, so to speak, barkers for the job they are about to do. This style went well with producers of the old school, but its effect is not guaranteed on the more recent models. Some writers, in what I consider a mistaken honesty, adopt an aseptic attitude in the writing of their treatments: that is to say, they tell the producer exactly what he is going to get. This I do not recommend. To begin with, it is impossible in summary to say clearly what any picture is going to be like. One cannot, for example, sum up characterizations. The producer, furthermore, at least in the early stages, always wants more than he is going to get and the style I have employed and found most successful is the informal but reassuring approach, the kind of thing the late Henry Van Dyke would have done as a preface to a young poet's first volume of

The studio tank is used to represent all bodies of water. Here, as soon as the boat is ready, it will represent the Mediterranean near Naples, on which Walter Huston sails against a Neapolitan set in "Dodsworth." (Courtesy of Samuel Goldwyn Productions.)

poems. The main object, after all, is to tell the producer that everything is going to be all right, which, at this early point, he is only too willing to believe.

Once the treatment has been accepted with slight modifications at a second story conference, the writer proceeds to write his first draft of the script itself. It is not well to put too much of one's heart into this first draft. There was once a writer who explained his failure with an adaptation by claiming that he made the mistake of writing his fifth draft first. This somewhat enigmatic remark will become clearer as our discussion proceeds.

For myself, whenever I start writing my first draft of a screen adaptation, I find fault with the whole process up to this point. I discover that long before I have had opportunity to develop any convictions of my own, I am seriously confused by the unconsidered opinions which have been thrust at me and which have distorted any intention I may have had when I wrote my treatment. I proceed therefore on the theory that the sooner the first draft is on paper the sooner the real work will begin. My single object is to put the book roughly into picture form, sequence by sequence and scene by scene, including in it as many picture ideas as may occur to me, but making no particular effort towards a finished script.

The process of reducing a novel to picture form is really much the same as that of dramatizing it for the stage. Plays, however, have in great measure to be re-dramatized in order satisfactorily to fulfill the screen's demands. A novel is a story which its author tells without any help from the outside. A play is a story so written that it is incomplete without the services of a company of actors. A picture is a story written to be photographed, and so keyed in its writing that the camera will never be called

upon to photograph anything not visually interesting. Narrative, which is of great value to the novelist, is impracticable on the screen until it is dramatized into those conflicts between characters which produce dramatic situations in photographable action. The play scene in which two actors may sit on a sofa and discuss matters of engrossing interest to the theater audience is impracticable on the screen because it is dull to photograph. Two illustrations occur to me.

It will be remembered that the crucial situation of Mr. Lewis's *Arrowsmith* has to do with an experiment performable only upon human beings, the purpose of which is to test an inoculation against the bubonic plague. Martin Arrowsmith goes to the scene of a West Indian epidemic committed to dividing the possible victims into two lots. One lot is to be inoculated, the other to be left without inoculation. The observed results are to constitute the substantiation or discrediting of the inoculation. Mr. Lewis spends a considerable portion of his book on making this clear in scenes which, though fascinating to read, would have been deadly to photograph. After Arrowsmith has worked out an entire series of preliminary experiments, he and his chief, Gottlieb, discuss the problem in long passages of scientific dialogue.

When we came to making all this clear and interesting in the screen version, Mr. John Ford, the director, and I had to devise an entirely new episode for the early part of our picture, basing it upon an incident which Mr. Lewis had mentioned only in passing. We took a moment, in that portion of the novel which deals with Arrowsmith's early career as a country doctor, to develop a local cattle epidemic in the course of which Arrowsmith divided the cows in a single barn into two lots, inoculating one lot and

leaving the other unprotected. We made this interesting by building it up into a fist fight between Arrowsmith and the State veterinarian. Its real value, however, lay in the single shot in which Arrowsmith was able to point to the healthy condition of the inoculated cows and to the empty stalls of the uninoculated. Then, when we came to our climax, Arrowsmith required only one reference to those cows in Dakota and the picture could move on without delay to its climax.

My other illustration has to do with the transferring of a play scene to the screen. In the third act of the play I made from Mr. Lewis's *Dodsworth*, which I subsequently re-dramatized for the screen, there occurs a scene in the American Express office in Naples. In this scene Dodsworth, abandoned by his wife, now a lonely traveler through Italy, re-encounters Mrs. Cortright, the second woman of the story. The thing on the stage was simple enough. Mr. Huston as Dodsworth and Miss Sunderland as Mrs. Cortright sat down on a bench and said the things which had to be said in order to advance the story. In Mr. Goldwyn's screen version, if the two actors sat down at all it was only for a moment. Then, still speaking the lines of the play, they moved out of the office and got into an automobile to drive through the streets of Naples. For this ride the conscientious Mr. Goldwyn had, through his foreign photographers, provided actual Neapolitan backgrounds. Thus, by a simple screen device, a play scene which would have been photographically uninteresting became one of the more notable moments of the picture.

In my opinion, novels make better pictures than plays. The playwright selects for his material a story which is most effectively told within the scenic limitations of the stage and is likely to suffer from overelaboration on the

screen. The screening of a play requires expansion, which is bad for a work of art. The screening of a novel, by contrast, requires contraction, which is apt to be good.

The motion-picture form lies somewhere between the novel and the play. It rejoices in at least the geographic freedom of the novel because it can move easily from place to place as a play cannot. However, the motion picture must do without the repose of either novel or play, and therefore without the reflective expansion of either idea or emotion. It has its own and most rigorous technique, which is best described by saying that a moving photograph must move and keep moving. In other words, its story, to be well told, must be told continuously in action. What the characters think or feel on the screen must be expressed by doing, and only strong and clear thoughts and emotions can be expected to pierce through a medium which, even in color, lacks the reality of the flesh and blood of the stage on the one hand and of the novelist's personal spell on the other.

The talking picture should if possible never pause to talk about itself. This is a lesson which many directors and writers of Hollywood have still to learn. One still sees too many picture scenes which are no more than photographed play scenes. By this I mean scenes in which the director has deluded himself into the belief that he is satisfying the action demands of the picture medium by moving his camera round and about a theater stage and cutting from close-up of A to close-up of B.

It has been said that the dialogue scenes of talking pictures should be written as though each were a full-rate cable for every word of which the writer has to pay out of his own pocket. Length hangs like doom over any picture. Wonderful as the motion-picture camera is, it is still

a piece of machinery, and photographs of actors and actresses are not living actors and actresses. It is probably this removal from reality—or, if you like, from contact with a living imitation of life—that so sharply restricts the time accorded a picture for the telling of its story. Audiences will sit in the theater and watch living actors with complete contentment for two hours and a half and, when they are remarkable actors in a remarkable play, for close on three hours. It does not matter how excellent a picture may be, it is, in my opinion, too long if it runs beyond an hour and a half. Even as fine a thing as the screen version of *Mutiny on the Bounty*—and that is a fine thing, judged by any artistic standards—seems too long to me. Thus the impression of the freedom of the motion-picture medium is largely an illusion. I have more than once struggled with the writing of sequences which were technically as difficult and as limited as the sonnet.

Furthermore, each new mechanical development of the screen seems to increase the exigencies of screen writing. Some ten years ago, the invention of sound altered the entire approach for director and writer as well as for actor. The difficulties of writing for color pictures are still to be explored. Color is far more than a technical addition. It will, in my opinion, alter the approach to picture making quite as profoundly as did the introduction of sound ten years ago. I do not know how many directors and writers will at this time be prepared to agree with me when I say that I find the problems of color far more baffling than those of sound. They seem to require me to develop a painter's imagination to a degree of which I am incapable. Black and white photography has its own visual continuity. It can move from walnut library to summer garden or from Greenland to the Sudan without any sudden shock

to the eye. The color picture cannot take such liberties. In black and white, for example, we can send our hero to his library window, cut without shock to a brief flash of what he sees out-of-doors and return again to the library. That cut will, in color, be both unsightly and distracting, because it is not a shift from darker to lighter gradations of black and white but from dark brown to pink, yellow and green. We shall be required now to work out a new and more subtle method of moving from place to place. We shall also, I believe, have to invent a way of writing and directing our scenes so that the relative values of their compositions will maintain some degree of visual balance. I remember very clearly my dismay as I first watched Mr. Robert Edmond Jones's production of *Becky Sharp,* a picture produced in color but directed according to the usages of black and white. In that picture, scene after scene began with the most beautifully composed arrangement of color, only to disintegrate immediately the action started into such confusion that I found it difficult even to follow the story.

But I am again digressing from my account of the screen writer's job. I adopt my system of being generous with myself on my first draft of a picture script because I know that no one is going to pay much, if any, attention to it except the director, who, under ideal conditions, now becomes my dominant collaborator. The opening sentence of this chapter states that pictures are made, not written, and the director has to make them. When, therefore, the director and the writer sit down together, it becomes the writer's duty to say to the director: "How do you propose using your camera? How do you propose handling the action in the best photographic interests of the story you are going to tell?"

The director now proceeds to contribute his ideas and the script begins to take the form of a motion picture. There are still directors who like their manuscripts divided into many hundreds of little scenes: close-up, medium shot, long shot. The more modern director, however, prefers a manuscript which reads as simply as a play. He will wait, even beyond the actual shooting, until the assembling of the film before he makes up his mind concerning the more technical details.

I have found it valuable to include the studio's art director in this collaboration, because even the most gifted of directors can, if he is willing, make good use of the art director's exclusively visual type of mind. The larger studios of Hollywood divide their picture making into various departments which have little contact with one another. Smaller production units, notably Mr. Samuel Goldwyn's, are too clever for this. It is Mr. Goldwyn's custom to keep his highly gifted art director, Mr. Richard Day, in constant touch with the progress of the script. The result of this triple collaboration is a completely illustrated edition de luxe of the script which contains literally dozens upon dozens of thumbnail sketches both of photographic compositions and of camera angles. This method of working not only provides the director with invaluable memoranda when, finally, the cameras begin turning, but tends to keep the script itself a thing to be looked at rather than to be spoken. That, it cannot too often be repeated, is the all-important quality for any picture script to achieve.

I do not know how Mr. John Ford and Mr. Dudley Nichols worked together in preparing the screen version of Liam O'Flaherty's novel *The Informer*, but I have always felt all possible admiration for Mr. Nichols' work on that picture. It is a piece of screen writing which any

man interested in the medium should study for its truly beautiful economy, its photographical eloquence, its faithful translation of the material from one medium to another and the selfless professionalism with which the writer has served his director.

At the end of a fortnight or three weeks spent on this second draft collaboration, the script returns to the producer and the real fun begins. All producers seem to be divided into two types. For myself, I prefer the type which undertakes to produce, more or less, the picture the director and screen writer have given him. That type of producer, though he may impose criticisms and amendments of his own, keeps in the track which has been laid down, spares director and writer no end of headaches and usually turns out fully as good a product as the other type. The other type, of which there are too many examples, seems to be a kind of kee-wee, as the British Royal Air Force used to call its ground officers after the Australian bird which has wings but cannot fly. By this I mean the producer who is neither director nor writer and would like to be both.

This type of producer operates without the wisdom to see that another man's way of telling a story may be as good as his own. His determination to get his picture script written and rewritten until it coincides exactly with his own conception is more than likely to choke out the last germs of spontaneity and life. It frequently leads him to engage a whole series of writers, both in collaboration and in sequence. This not only wastes untold quantities of money—such producers have more than once spent close on half a million dollars in screen writers' salaries—but deprives the finished picture of any homogeneity of style.

Producers of this type are to be avoided by the wise director and screen writer.

All producers and directors seem to have one weakness in common. They are unwilling to face the fact that their scripts are too long, and proceed in the delusion that they will not need cutting after the film has been shot and put together. The picture which is cut to length in script can be smoothly cut and the cuts blended over so that they will not afterwards be apparent. The picture which is shot from an overlength script and cut after it has been put together will always show the bad joints of crude carpentry.

The script from which the picture is made—it may be the second or the fifteenth, according to the type of producer—is called the shooting script. Before it can be made, however, it has to be submitted to the censorship experts of the Hays office and these gentlemen scrutinize it in their knowledge of what is permitted by the Censorship Boards of varying States. Their function is to warn the producer against the deletions which he may expect in any given State, if he violates any of that State's regulations. I am always sorry if I am not present at one of these censorship sessions because nothing gives me more pleasure than anger at censorship. Censorship is so inaccessible. It operates in its methodically remote way and one never gets at it. One never meets the censors. One never knows what type of fanatic or racketeer the censor may be. I find it comforting to sit in the same office with Mr. Hays' experts and to scream at them as though they were themselves the censors, and they are accustomed to being screamed at and seem not to mind.

It is healthfully infuriating to be told that storks bring the babies in certain States, that the word "Communist"

cannot be mentioned in the Dominion of Canada, that Hitler, Mussolini and the Republican party may be offended by Mr. Lewis's *It Can't Happen Here*, which must therefore be banned on the eve of its first day of shooting. In that connection I remember one of the most charming, I think, of all censorship observations. One episode in that unproduced script showed how Mr. Lewis's editor-hero escaped from the American dictator's concentration camp. Jessup, the editor, reaches a farmhouse in the Green Mountains of Vermont, where the women of his family are waiting to welcome and to secrete him. Among other things he is given a bath, in the course of which his wife has to scrub his back for him. No camera ever looked at the scene, because, as I have said, the whole enterprise of the picture had to be abandoned out of deference to Hitler, Mussolini and the Republicans. The censors, however, warned us that the business of the back-scrubbing was permissible only if the actress who was to play the wife was cautioned never to look down. The couple were past fifty and had been married long enough to be grandparents, but the wife must not look down, for fear, presumably, of making some startling anatomical discovery.

Once the criticisms of censorship have been made, the script proceeds to what is called the *breakdown*. In this stage of its development it is taken over by technicians who estimate with astounding exactitude how many days will be consumed in the shooting. These technicians transform the script from some hundred and twenty-odd typewritten pages to a vast board covered with tiny tickets, each ticket representing a scene or *set-up*, and the total number of days' shooting produces still another crisis in the picture's progress, because it is the length of the shooting schedule which most determines the ultimate cost of

the picture. The technicians work on this breakdown day and night until the total of days and dollars is ready. Then comes that final painful conference in which art perforce gives way to business and the writer-director collaboration has to face the music of subtracting a hundred thousand dollars from the budget. Once this is done—and it has to be done in spite of the screams of writer and director—the writer's contribution has been made. He is very seldom on hand while the picture is shot. If he is one of the regular Hollywood writers, his agent has shipped him on to pastures new. Our New York writer is free to return to New York or whatever part of the country he calls his home. He may take the train or walk if he likes. There is no longer any pressure on him to fly.

There has existed among authors, and for many years, a great snobbery against writing for pictures. The New York author has been ashamed to engage himself in it and the screen writers have been hypersensitively defiant about it. There is no longer justification for either snobbery or defiance. The mechanical improvements in picture making have been paralleled by an equal aesthetic advance and closely followed by an astonishing growth in the taste of the picture public. With each year the best product of Hollywood has become increasingly beautiful to look upon and increasingly mature in its choice of subject matter until, in the pictures of René Clair and in such Hollywood offerings as *Pasteur* and *Zola*, the taste and intelligence of the screen public has outstripped that of the New York theater audience.

However secondary the writer's function in the making of pictures may be, two facts should at once be conceded: that as long as writers earn their living by writing they are economic nitwits not to earn at least some of it where

the pay is both high and certain, and that to the very vast majority of the international public, the screen has superseded both plays and novels. In view of these facts, it is always amazing to me that more writers have not realistically turned their minds to studying the technical aspects of screen writing. A leading Hollywood producer recently told me that of all the droves of writers in and out of Hollywood, he knows less than fifteen capable of seeing a script through from treatment to production. This statement may well have been colored by unfortunate experience. It is, however, a custom in Hollywood to provide a screen writer, who finds plenty of time to learn golf and contract bridge, with a continuity writer. A continuity writer is a gentleman who shakes his head gravely over any idea the screen writer may have to offer and remarks: "That may be all right but it isn't pictures." His function is to relieve the writer of the obligation to learn his job and to complicate the already complex collaboration with his director. I have never myself had to contend with continuity writers, but it is undoubtedly true that the studios could not operate without them. Frequently the New York writer-hero of this chapter is, upon his arrival in Hollywood, given a neatly typed outline of the picture as it is to be made, with orders to conform to it. Though the producers may with some justice explain this condition as a result of literary laziness, I believe that the whole system of the employee-writer is basically an unsound one.

The creative instincts do not thrive on salary. When a screen writer boasts that he has managed to get twenty or thirty weeks of employment out of a single picture, he is, in my opinion, indicting the system which makes him an employee. The average screen adaptation of book or play

should be ready to shoot after six or eight weeks of normally intensive work. If more time is needed, there has been waste somewhere. The producer will claim that the writer has wasted it and the writer will counter with his total of the days he has spent waiting for the producer to read what he has written.

I cannot, in justice to the producer, refrain from one observation calculated to endear me to my Hollywood colleagues. The more fortunate of screen adaptors—in which number I am happy to include myself—are probably the most preposterously overpaid men on the face of the earth: at least, we are paid as much for doing as little as anyone now visible to my naked eye. The producers, on the other hand, pay far too little for original story material. Novelists and their publishers have not even begun to claim their share of the Hollywood loot. This chapter is designed as a compendium of practical, rather than artistic, hints. Within the last year, one of the most illustrious of all publishing houses sold the picture rights to one of the outstanding successes of modern fiction for exactly one-fifth of the value placed on it when a second studio tried to repurchase it from the original buyer. It is time for the fraternities of novelists and publishers to wake up to the state of the world in which they are operating.

This is not to say that there are not many screen writers capable of the most excellent work. The writer-director collaborations of Hollywood produce a round dozen of first-class picture scripts every year. I have already paid my respects to Dudley Nichols' version of *The Informer*. I can scarcely say less of Mr. Robert Riskin as Frank Capra's collaborator in those two most enchanting film comedies, *It Happened One Night* and *Mr. Deeds Goes*

to Town. Talbot Jennings, once an original author of distinguished accomplishment, did remarkably by *Mutiny on the Bounty.*

The fact remains that the hundreds of screen plays turned out each year by the Hollywood studios contain few if any more items of real excellence than are to be found among the few dozen stage plays of the New York or London theatrical season. The obvious moral of this is that the money which builds and equips studio plants and motion-picture theaters can neither build nor equip a talent for writing. The more fundamental explanation of it is that literary talents seem to derive most satisfaction from being left to their own independent devices between the bindings of books and in the dingy and dusty reaches of back-stage.

The screen will get most from its writers, and the writers most from the screen, when motion-picture bookkeeping and business methods have been so revised that the author of a picture is paid a royalty on its gross receipts and not a salary while he is writing it. Why I should be paid a salary while I am adapting a novel to the screen and a royalty when I dramatize the same novel for the stage I do not understand. I do know, however, that in the studio I am through on receipt of my last salary check, whereas in the theater I am at work up to the last moment before the opening night, because, being human, I know that my reward is still to come and depends upon my doing my very utmost. Art, like a great deal else, is made more interesting by financial returns. The screen will presently have to revise its method of dealing with its writers, just as writers will have to revalue their attitude towards the screen.

This is all the more true because the screen is rapidly

running short of material. Contemporary literature no longer supplies the demand. A Hollywood story editor has complained to me that authors these days are falling down on their job. Screen material used to be easily found. Now he must read hundreds of plays, novels and short stories in search of one worth making into a picture. For this shortage the screen itself is in large measure responsible. Too many authors, of talents both rising and matured, are delegated by the studios to rewrite the works of other men and are thus kept from writing on their own account. Hollywood would do well to confine the purely technical business of screen adaptation to writers who are adaptors and technicians by temperament and to leave every man capable of original creation free to work on that. The enormous number of pictures made every year has driven the studios back to revivals of former successes and to refuge in the classics. Neither revivals nor classics will fill the gap forever and the need for original screen plays is already pressing.

A considerable amount of original screen material is constantly in course of concoction. This may be an unkind, but is not, I think, an unfair way of stating the case. The original screen play presents a knotty problem to both studio executive and film distributor. A successful stage play or a best-seller novel is each a known quantity and bears a thoroughly advertised title. The unknown work written directly for the screen is a mystery to the public except as a vehicle for a popular star. "I need a picture for March and Gaynor," says Mr. Selznick, and Director Wellman and Author Carson join with him to concoct an assembly of safe and sane formulae known as *A Star is Born*. The venture proves a profitable one, but is unlikely to crown with fresh laurels the brow of the producer of

David Copperfield. The original screen play has not yet grown beyond the synthetic vehicular phase. Until it does so, we shall not have to take it more seriously than it deserves, and that is a good deal less seriously than we take the adaptation of established novels and plays.

But the day of important original screen plays is near, when our O'Neills and Kaufmans will be writing for the screen as independently as they now write for the stage and arranging for their productions, not out of deference to the higher weekly salary, but with the same greed for the best artistic conditions of cast and direction which they now impose upon the theater. This is inevitable because the best talents for producing, directing and acting have already been drawn to the screen and because the stage's bitter complaints against the screen will very presently be silenced in virtual extinction and the thing called drama, of which stage and screen are both passing manifestations, will continue indefinitely to entertain mankind. In the screen drama that is to come the director will continue his domination, at least until the screen has welded director and screen writer into a single individual. But the writer's side of this superman will still play second fiddle and screen drama will not be literature but something else, something new. It is always a sound idea in art, as in life, to welcome anything new when it is good, and motion pictures seem bent on growing better and better.

IV

THE VOICE BEHIND THE MEGAPHONE

John Cromwell

WHEN I first came to Hollywood from the theater, I was told upon my arrival, as a preliminary to my first assignment as a director, to look for a story. This was some eight or ten years ago when the talking picture was in its infancy and before so many fine minds had been attracted by the new medium. I set about looking for a story in the files of the studio story department (naturally I was asked to make my selection from the material on hand). For several weeks I read lengthily, if not too well. Finally I came across a story which appealed to me, and, anxious to get started, I hurried to the author to discuss with him certain changes which in my capacity as a director I felt were necessary. He agreed with me on all of them. But when I asked him how soon he could make these changes, he looked at me in great surprise and said, "You don't want *me* to make them, do you?" "Why, who else but you?" I answered. "Well," he said, "we write a story out here and hand it in. If it's accepted, we're delighted. But we don't expect to hear any more about it until the preview and then if we have the good fortune to find one scene of our own that we recognize, we feel very flattered." I explained that in the theater it was considered a very poor breach of etiquette to consult another writer about changes

on a script, unless the original author had given up completely. This screen writer looked at me in some astonishment and I have been told his encounter with me was his topic of conversation for some time following.

At that time, it was believed impossible to obtain a successful screen story without employing a great many writers. In fact, their number measured its success. This belief probably grew out of the demand for competent screen writers which far exceeded their supply. All this, as I have said, was some eight years ago, and since that time pictures and the making of pictures have come a long way. I have come also to certain very definite theories about the motion picture and the varied processes it must undergo before it is given to me to translate into living situations and personalities for the screen. I have come to believe that if studios would look at what the author has created as the thing worth producing, and would take the trouble to develop writers—especially young writers—to a point where their efforts are worthy of production, pictures would be much better for it. Not until a determined effort is made to develop writers who have something to say, and have learned to say it in the medium of the motion picture, will the motion picture as an industry really have some claim as a creative art.

Once the story has been agreed upon, the producer, writer and myself enter into a general discussion as to its treatment. This will vary, of course, if the story is in the form of a novel, short story, an original story or a play. I believe there are very few plays in their original form which lend themselves to the motion picture, because the medium is so totally different. In most plays the story is static, and it needs a great deal of ingenuity to transfer it to the visual medium. A screen story must flow, it must

John Cromwell directs Madeleine Carroll and Ronald Colman in a "take" for "The Prisoner of Zenda." In the background may be seen the electrical, sound and camera crews, make-up, wardrobe and property attendants, who are always on the set during the shooting. The Junior solar spotlights on either side of the camera are used for back lighting. (Courtesy of Selznick-International Pictures.)

tell its story through the eye and the emotions: a play, on the other hand, tells its story through the mind and the emotions.

Having conferred thoroughly on the treatment, dramatic construction and character of the story with the director and producer, if the latter has anything to offer, the writer goes away to make a first draft. This is then submitted to the producer and myself and adjustments are made on this basis. In working out the treatment the author may have found flaws which were not apparent at first, such as in the logical development of the story. It has sometimes been necessary to change a dramatic story into a comedy so that the writer could take more liberties with the plot line.

In *The Prisoner of Zenda*, for example, we were confronted with an antiquated, nostalgic story. Our problem was either to tell it realistically as well as possible, to tell it with our tongue in our cheeks, or to endeavor to create a period in which our story would seem credible. The first two methods would obviously not stand up today. But, in the third, we were able to realize enough of our original intentions to make the result both interesting and exciting.

When a director gets a story, he has a pattern which includes the original idea of the writer and his comment on the story. These are uniquely his; they should not be supplemented by any other writer who might blur the final conception of the story. The director adds only enough interpolations of his own to give the story the fluidity a screen story must have. It must then be conceived and formulated by the writer and director as a complete entity. How the director will interpret this is the next step in its proper place. His own individuality is apparent in the way he shoots and edits the picture, and the manner in which he builds up the story expresses his point of view.

While the writer prepares the final shooting script, the director confers with the producer, art director and cameraman as a matter of course. The completed script contains a full description of the locale and atmosphere of the scenes, explicit camera angles and effects, detailed descriptions of the characters as well as the dialogue and sound effects. This is then sent to all departments so that each will be as familiar as possible with the director's requirements. These departments of the motion picture, in the main, are in safe hands. Most art directors and most cameramen have real understanding and feeling. The art director should be able to understand from reading the script just what is needed in his interpretation of the story in terms of the sets. He must be sure to cover it from every conceivable camera angle. For example, in designing a large ballroom set, he must have enough variety of angles to cover the length of the scene when the cameras are placed in various positions.

The interpretation of the cameraman is also brought to bear on the script. Usually we discuss our viewpoints in a fairly exhaustive conference. The cameraman often makes valuable suggestions which may necessitate changes in the script. I have already laid out the general pattern of the camera angles or shots in my mind. But the greatest danger to avoid is any set or predetermined ideas about camera angles which are not amenable to suggestions from the author, the art director or the cameraman, or, later, to circumstances on the set. Camera angles should never be completely fixed in the script. Very often they are changed to facilitate a more dramatic emphasis in a scene or a more interesting way of telling the story.

On the premise that a director to be a director should be able to determine what it would cost to shoot successfully the story agreed upon, he should be allowed, and invariably

is, to determine how the money should be spent. Of course the production manager supervises the various details of the budget, which include the estimates of all departments involved in the production. But this budget must always have enough latitude so that the director can completely effect his visualization in terms of the finished film.

As the pre-shooting preparation proceeds further, the director is confronted with innumerable problems which must be solved before the production gets under way. In this he is given invaluable aid by the assistant director who has charge of all routine matters connected with the production and who has mapped out the script into the various shooting days, so that it may be finished with the maximum efficiency. Now every department clamors for his attention with a hundred and one details.

First there is the casting problem to settle. His star or stars have already been chosen by the producer. He must accept or reject the casting director's final choice of players. He must look at the tests made under his supervision of these players or at their work in previous films. With the casting settled, he must confer with the wardrobe department on costumes for the principal players and later make tests of them in their wardrobe and make-up to see that they are in character. He must make a final inspection tour with the art director to see that the sets are properly built and dressed or decorated. He must pass on all properties to be used. He must confer with the musical director as to how much and what type of background music is required. He must confer with the location manager on a suitable site, if the picture is to be shot on location. He must confer with the art department together with the special effects department on any miniature sets which must be built, and with the special effects and camera department on process

or transparency shots, which generally form a part of every feature production. And he must confer at frequent intervals with the producer on the progress in the preparatory stages of the production.

I like to rehearse the entire script with the players at least two weeks before I start shooting. The value of rehearsals is twofold: they enable the director to get a view of the whole story and they permit the actor a complete conception of his part, so that if we shoot according to schedule, starting with the middle of the story, jump back to the beginning, ahead to the climax and then back to the second third, the actor will have the complete conception of his part so thoroughly in mind that his acting out of continuity will not greatly disturb him.

The greatest factor against proper rehearsals is the fact that very few stories permit them because of economic reasons. Of course, I cannot blame a producer who has paid a large sum of money to an actor in an important part for concentrating on that part. If it is spread out over the script, the producer naturally will try to concentrate it into one week's work instead of three or four, by adjusting the shooting schedule. But it has always been my contention that I could find economies in the usual picture which would make up for the expense of carrying important actors from the date of their first rehearsal to the first day of shooting, and this certainly curtails the actual shooting time.

There are two schools of directing. In the first, the director is and insists on being all-powerful, so that any creative thought on the part of the actor is apt to infringe on his ideas. What he most desires is to manipulate facile and clever automatons which are nevertheless possessed of great screen personality. In the second school, the director

wants actors who are really creative, so that he can mold these various creations into a whole which fits in with his idea of the story. I liken a director of a picture or a play to the director of a symphony orchestra in which his job is merely his interpretation of the author's idea through which he makes his personal comment on the story. This presupposes that each actor with whom he works is a creative artist in his own right and that the director's job is merely to guide and fuse these individual creative interpretations into a harmonious and expressive whole.

The old theory about acting in pictures seemed to be based on the common belief that the screen required no acting in the proper sense of the word. Actors were little more than puppets with a talent for mimicry or an abundant supply of facile tricks, so that when they came on the set, bolstered up by personality, their stock question would always be: "What do I do in this scene?" As director, I deplore the lack of initiative and imagination in the great majority of screen actors. I would go so far as to say that I could count on two hands the actors in Hollywood who are truly creative. The majority have not the slightest conception of what the word creative means. This lack, and the inability of the actors to realize it, may be due to the essential difficulty of screen acting. Few actors are conscious of the fact that their whole conception of a part must be completed before they start on a picture. In the theater, that conception is a matter of growth through from three to eight weeks of rehearsals and trial. In pictures, all this must be accomplished before shooting begins. Nor have screen actors learned to consult their directors exhaustively in this process. To conceive one's role completely beforehand requires great personal integrity of an actor, because he must accomplish this in spite of the many

and persistent obstacles of studio routine. I am frequently amazed at actors of great integrity and purpose coming from the theater to do pictures and supinely yielding to that routine.

When the director starts shooting, he has the story so completely in mind that he knows exactly what he wants. The old style of shooting a scene was to take an establishing *long shot*, play the scene through with a *medium shot*, and then use a *close shot* for the characters. This was called "being thoroughly protected." I think that a director should save all that time and energy by learning the art of film-story-telling, and cut his picture as he shoots. Fundamentally he has a choice of two kinds of technique: starting on a fairly close shot of some action that is either revelation of the characters or story, then proceeding back to a revelation of time and place, or establishing the locale first and then progressing up to the characters. Using the first method, the picture might open on a close shot of a newspaper lying on the pavement with the camera *tilting up* to the little boy who is standing over the newspaper reading it, and from there moving horizontally or *panning* over to a man standing on the street and watching the little boy, when the story begins. Using the second method, you might open on a long shot of the street, then move the camera towards the little boy in what is known as a *trucking shot*, and finally pan over to a shot of the man as the story begins.

The most effective way of telling a story on the screen is to use the camera as the story-teller, selecting and concentrating upon objects which are the center of dramatic interest. The camera may be used objectively or subjectively: as an onlooker or as the eye of one or more of the characters in the story. It is enabled to do this because

of its mobility: it can see objects from a distance or it can magnify them; it can move freely or remain fixed; it can turn or tilt, swing, peer through keyholes, swoop or crawl.

Sometimes the camera uses objects as a means of creating suspense. In *The Prisoner of Zenda* we had a scene in the king's hunting lodge on the morning after a hard night of drinking. Ronald Colman as Rudolf Rassendyll is still asleep, and extraordinary means are necessary to awaken him. Here we used a silver water pitcher to create suspense and to introduce the characters in the scene. We began with an extreme close shot of the pitcher filled with ice-water and carried on a tray by Joseph, the servant. As he enters the main room, the camera travels ten or fifteen feet seeing only the water pitcher. Then the camera stops and we see a hand grasp the handle of the pitcher, draw it back and throw its contents. The camera now draws back to show that the water hits Ronald Colman full in the face, as he is sleeping in a chair. This shot is held until he reacts to the sudden shock of the water, then cuts to the man who threw it.

Each shot here was a separate *set-up* or camera position and each had to be made individually. Here no additional protection shots were necessary; we used our judgment in the amount of footage. Before we started shooting, I rehearsed part of the scene for the action, then once for the cameras and lighting and once for the sound department, which checks the level and position of the actors' voices. Generally not over three *takes* or separate film records are made of each set-up. We may do a scene of half a minute or of four minutes, but we always rehearse it thoroughly first before taking it. The number of set-ups which can be made each day depends on the amount of change of the position and lighting. A good cameraman should be able

to make one set-up in about forty minutes, or at least eight set-ups a day.

During production, the script girl is of indispensable help in taking detailed notes of everything connected with the shooting: all business, all placements of the actors, use of props, the footage, angle and lens used for each scene. Without these notes the director's task would be infinitely more involved.

The shooting schedule varies from forty days to sixty or seventy. Every evening the director looks at the rushes of the previous day's work, selecting the best takes and discussing with the editor the feeling and tempo he wants for the entire film. When the picture is finally cut, and scored by the musical director, it is then ready for preview. The reactions of an audience are his best guide for the necessary changes; these are made until he feels the film is right. When the negative is cut to correspond with this positive, the picture is ready for the screens of the nation.

The advantages of the screen director are obvious: he has more money at his disposal than the stage director; he has unlimited technical facilities at his command. But he does not have the human emotional reactions of direct contact with his audience; instead, he must be his own audience. Perhaps his greatest handicap is the lack of understanding of his supervisors. In most cases, he should be allowed the final say on the production he is directing. Nor should he be forced to do stories in which he does not believe. He should be allowed to do stories in which he *does* believe, even if they involve censorship. Next to supervision, censorship is the most difficult handicap to overcome and he is always obliged to compromise. The story must either be abandoned or the director must change the story to such an extent that its entire meaning is lost.

It is desirable for a director to have a limit to the number of pictures he directs each year. This should not exceed three. There is not sufficient time to make more because one production alone takes from twelve to twenty weeks, of which eight weeks are spent in the pre-shooting preparation. And he must have time to see the production through to its completion.

As the problem of color is entering more and more into the making of pictures, I would like to include mention of it here. When the mechanics of color will have been perfected, there will be no more difficulties in the production of color pictures than there are now in black and white. I believe that color should be the perfect stage setting for the story, as are some of the stage designs of Robert Edmund Jones, which so caught the mood of the play that they completely satisfied the eye and the author's conception of the setting without even slightly intruding themselves on the audience. When color reaches the point where audiences take it for granted and are not startled into a lack of attention of the story itself, then it will be an added means of telling the story as dramatically as possible.

All through the production the director must co-ordinate the work of the technical departments, which check the numerous processes, and the hundreds of indispensable workers engaged in the making of a motion picture—to the end that a story may be translated from paper into film. If, in spite of the many minds contributing to its shaping, the visualization of the director is achieved, then the co-ordination has been successful and the dominance of one mind is apparent. And if the technical and mechanical factors involved are subservient to the director's conception, there results an individual expression in terms of a motion picture.

V

THE PRODUCTION TAKES SHAPE

Clem Beauchamp

BEFORE the duties of the production office can be discussed, it is well to remember that so far this book has spoken of production plans, selection of stories and directors, and the respective contributions of each towards the finished product. When the time comes for the plans to be carried out, and the shooting script—the final transformation of a story into a screen play—has been approved, the director is ready to start production. Men and material are now needed to translate the plans into reality; it is here that the production office enters. The tears that are shed during a dramatic scene, the pies that fly through the air in a slapstick comedy, the exclamation mark at the end of a sentence in the script, must be computed, made or bought; rain, snow, sunshine and storm must all be figured in dollars and cents. In short—all material, all man power, and all the space needed for a motion picture become the problems of the production office.

Of course, there are methods to cope with this enormous task, departments to take care of the details, liaison men to watch over the progress of production and thousands of experts, artisans, mechanics, buyers and office workers to start the wheels of production going. Their efforts are coordinated in transforming the thought of the producer, the

story of the author, the screen play of the scenarist and the guidance of the director into a finished motion picture.

When the year's production schedule has been announced, the production office then allots a certain number of pictures to be made each month, so that they can meet release dates. He thus avoids having too many pictures in production at the same time, creating a lack of stage space and holding up production. For instance, if the studio has sixteen stages, it would be advisable not to have more than ten pictures shooting at once, since one picture may have twenty-five or thirty sets, and these would each occupy about four stages.

As the scripts are turned in to the production manager, he assigns a unit manager and an assistant director to each production. He must be careful to have the pictures started on time to meet release dates. He must allow sufficient time for the shooting of the picture, and the six to eight weeks in the cutting and dubbing rooms, before it is ready to be previewed and shipped to the distributors.

First, when the production manager reads the script, he must see whether any superfluous sets may be eliminated, thereby holding down the cost of production. This will also affect set dressing, extra talent and electrical equipment. Elimination of sets may necessitate changes in the story, which must be discussed with the producer and director.

The next step is the breaking down of the script by the unit manager and assistant director. This includes a short synopsis of each scene, set and sequence, the cast which works in each, the bit players and the extra talent, their wardrobe and the amount of time allotted for each set or location. When the breakdown is finished, it is assembled,

and from this the shooting schedule is made. This schedule shows the amount of time needed in each set or location for the complete picture. It also includes the number of days or weeks that each character actually works, the number of days he is idle and the total number of days needed for the completion of his part.

The shooting schedule is sent to the various departments: camera, wardrobe (men's and women's), property, casting, art, make-up, electricity, sound, trick camera and special effects. Each department, in turn, submits its respective budget to the production manager.

Let us make the rounds of the various departments and see how they solve their manifold tasks:

ELECTRIC: The head of the electrical department receives a shooting schedule and then contacts the production department. Together they discuss the size of the sets and the amount of time to be allotted to each. In this way the electrical department can estimate the number of electricians, lights and the amount of electricity that will be necessary. Allowance must also be made in the budget for rental of equipment, replacing of broken light globes, and purchase of carbons for hard and sun arcs.

ART: The art department must estimate the cost of the sets through the construction department, which includes paint, plaster, iron works, practical plumbing, the striking of old sets, and preparing the stages and sets for rain scenes. If the sets are to be on location, the same thing applies, except that the cost of transportation, trucking and hauling must also be figured. The cameraman, director and head painter are called to the art department to discuss the paint and wallpaper to be used on the various sets. They examine samples of paper for color, texture, design, period and photographic qualities. If the picture is modern, the very

latest style of wallpaper, mural decorations and the newest floor and woodwork finishes are used. The head painter must bear in mind at all times that paints, lacquers and varnishes must be of the quick drying type, so that not only can all the painters work on the set at the same time, but also the carpenters, electricians and property men. The head painter is constantly on the lookout for new color schemes, designs and new types of paint that dry almost instantly, and at the same time give a hard, durable finish.

RESEARCH: Every major studio has a research department of its own, which supplies it with the special data and pictures of the country and period in which the story is laid. If the production involves a large amount of research, a technician is assigned by the production manager. The technician then contacts the art department, construction department, wardrobe, property, make-up and hairdressers, and supplies them with the special information.

It is important to get good technicians, and they must be carefully selected. For instance, if a picture is laid in India, it is advisable to get a native of India or at least someone who has lived there many years, and is thoroughly familiar with the native language and customs. The technician also functions as interpreter on the production when real natives are employed. If the picture concerns the army, a retired army officer is usually contracted to check on the uniforms, manual of arms, rifles and revolvers. No pain or expense is spared to make the picture as accurate as possible. Collections of photographs are made from museums, libraries and files from all over the world.

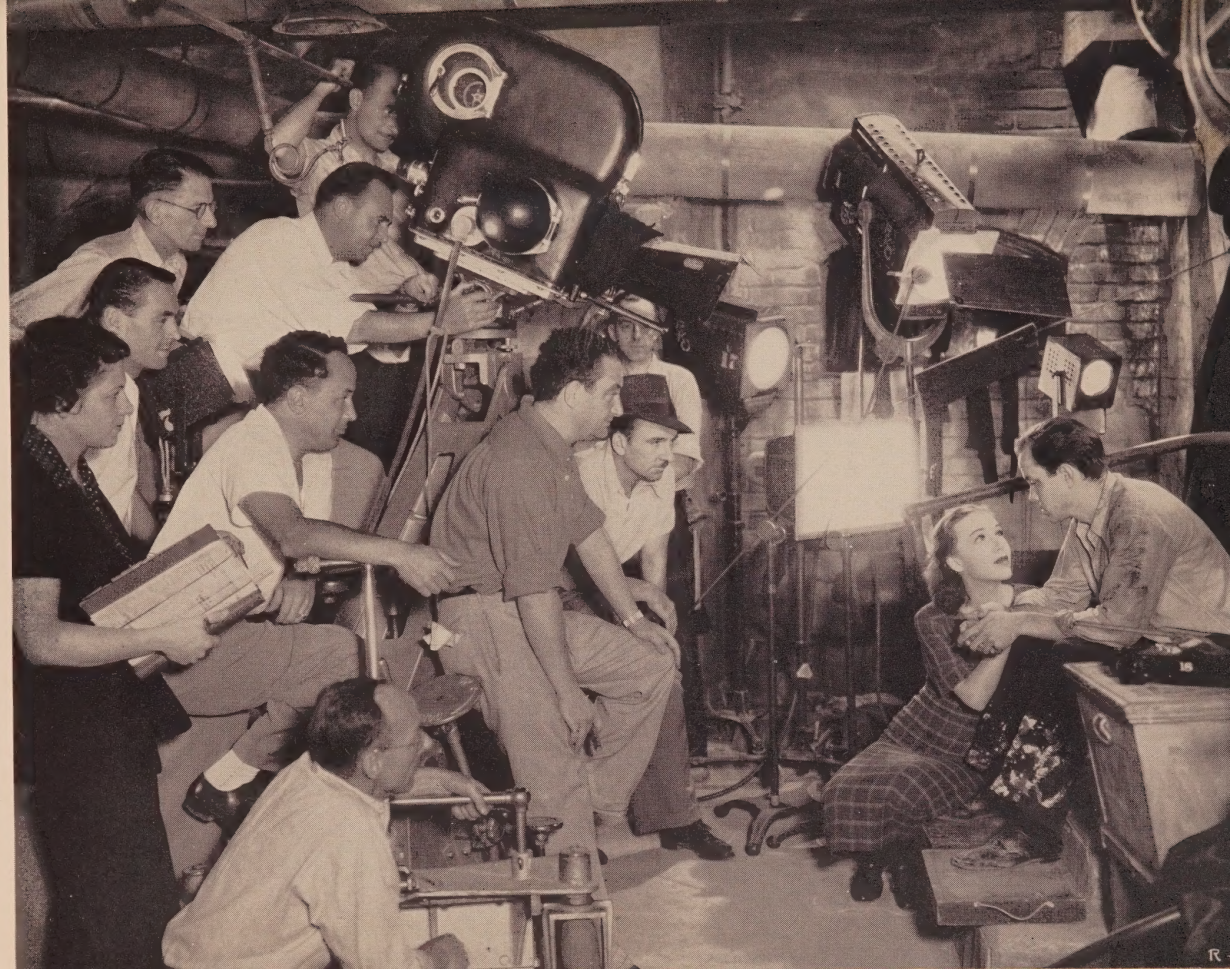
WARDROBE: For the wardrobe department to estimate its budget, allowance must be made for the clothing of the stars and feature players. This, as a rule, is designed by the sketch artists, under the supervision of the head designer.

The sketches must be O.K.'d by the producer, director and stars, before the costumes are begun. The amount of material to be used, the cost per yard, salaries of dressmakers, pleaters, embroiderers, bead workers and fitters must be included, as well as those of the designers.

If the picture requires period clothing, designs must be made of the costumes, types, color and amount of cloth to be used. If the correct color cannot be obtained for photographic effects, the material must be dyed and shrinkage allowed for. If uniforms of antiquated periods are needed, a design of the buttons must be sketched and dies made to stamp out the facsimile. Sketches of the correct cut of the uniforms, insignia, hats, caps, boots and spurs must now be made. If these costumes are needed in great quantities, it is often cheaper to contract with outside wholesale tailoring establishments to provide them. All these items are figured in the compilation of the wardrobe budget.

FILM: The average major studio allots approximately one hundred thousand feet of negative, sixty thousand feet of positive, and a like amount of sound track for each picture, the cost of which is figured in the budget. This footage has to be gauged by the type and length of picture and the individual director, as some directors use more footage than others. If it is a musical picture, film for scoring and dubbing must be allowed for over and above the original film allowance.

STILLS: A *still man* must be assigned to every production, and his salary and the cost of making the stills is charged to the production. It is important that he be fast and efficient, so that he can obtain production stills between camera set-ups. In this way he does not hold up the company, and at the same time makes the required number and variety of stills each day.



Taking a shot in "Winterset," with the camera tilting down from its tilt-head mounting attached to a perambulator, which may be used either for moving or stationary shots. The shot being taken is stationary. At the extreme left stands the script girl; beside the camera is Alfred Santell, the director; and next to him, Clem Beauchamp, who was production manager and assistant director here. (Courtesy of RKO-Radio Pictures.)

STAND-INS: Allowance must be made in the budget for *stand-ins* for the stars. These are people who are picked for their physical resemblance to the stars, having similar hair, eyes, height and general physical appearance. They always wear the same clothes and the same color make-up as the stars when working in a picture, so that there will be no difference in the lighting. The stars are usually contacted first, because as a rule they have their regular stand-ins who work for them all the time. As there is a set salary for stand-ins, the stars sometimes pay them personally every week, in addition to what they earn while working for the studio. Then the stand-in also acts as secretary, maid or valet, thus making a better and regular salary.

EXTRA TALENT AND BITS: The budget for extra talent and bit players is made under the supervision of the production manager, either by the assistant director or the unit manager. People who speak a few lines, or do special acts, come under the heading of bit players, and receive more money than the extra players. Allowance must be made in the budget for all scenes in which both extras and bit players appear. For instance, if the script calls for a large café sequence, the unit art director will know how many tables and booths are needed, and the required number of extras can be figured from this. Allowance must also be made for waiters, busboys, hat-check girls and doormen. If there is a possibility that these people will work overtime, this must also be computed in the budget. If special racial types are used, interviews are arranged through the casting office. For example, if one hundred people are needed, about one hundred and seventy-five will be called, so that the best may be selected by the director, assistant director and sometimes the unit manager.

PROPERTY: The property budget is submitted by the

head of the property department and includes the salaries of the property men, set dressers and set watchmen. Included in this budget are all rented props such as antiques, jewelry, animals and automobiles, and whatever special props must be made or purchased, such as flowers and food. There are several outside property houses which rent to studios on a daily or weekly basis.

The head of the property department must constantly check his schedule so that he will return the rented props as soon as the company is through with them. He does this by checking with the production manager to get a clearance on the props involved. But before giving the clearance, the production manager must get what is called a *negative O.K.*, which means that the producer and director have passed on the scenes in which the props appear.

DRAPERY: The drapery department has charge of all hangings, curtains, bedspreads, tapestries and upholstering. The head of the department bases his budget on the amount and cost of the above items used in the production.

SOUND: Each production is assigned a head recorder, assistant recorder, boom man and *grip* or carpenter. If there is a location in the picture, a maintenance man is also included in the budget. He acts as mechanic and generator operator or general utility man. Extra grips must also be included for locations, to move equipment sufficiently fast so as not to delay production. The salaries of these people are included in the sound department budget.

SCRIPT CLERKS: A script clerk must be included in the budget. Her duties are to time scenes, match action, clothing and furniture, watch and check dialogue, and type notes for each scene for the editor of the picture.

DIALOGUE DIRECTORS: Some directors use dialogue directors and, if so, their salaries are figured in the budget.

Their work is to rehearse the cast in their lines before the scene is shot.

Music: If the picture to be made is a musical, the musical director is notified and the type of music discussed. If popular music is to be used, song writers must be contacted far in advance so that they will have time to write songs to fit the picture. This applies to *background* music also, which is the musical score used behind the dialogue. All major studios have arrangers and well-known composers under contract.

The production manager calls a meeting between the director, composers and head of the music department. They decide on the type of music, the length of each number and its cost. Most major studios pre-score or record their music before the production starts. This is done on a scoring stage where all music is recorded. The stage is so constructed that the acoustics are correct and a nearly perfect sound track may be made. This system of prescoring is also used when certain actors and actresses do not sing or play. Then, good singers are hired and their voices dubbed in. The studios have found that this method saves considerable time and money. Besides, an actor can perform much better when he is not actually singing a scene, but merely mouthing the words to the song, or going through the motions of playing, as he hears it come over the *playback,* which is the playing on the set of the recording made on the film or disc.

Transportation: Every major studio owns automobiles, trucks, motorcycles, trailers and buses to be used for transporting people and equipment to and from locations. The unit manager, in making out his budget, must charge the picture with hourly and daily rates, such as thirty dollars a day for each truck and driver, or twenty-five dollars for

a seven-passenger car and driver. When outside transportation is used, the unit manager must consider whether it would be more economical to hire the trucks by the hour or by the mile. If the location is quite a distance from the studio, it is cheaper to keep the trucks or cars on location than to dismiss them and bring them back at the end of the day's work. All outside transportation must be properly licensed to operate under the State Motor Vehicle laws. This is particularly important in hauling people back and forth as, of course, the company is liable in case of accident.

Locations: Whenever location work is necessary, calls are put in as "weather permitting." Sometimes, during the winter months, a picture will be forced back into the studio by bad weather so frequently that all interiors have been completed. It is then up to the production manager to determine whether or not the company should be sent out on location, even if the weather is threatening. He must take into account the cost of transportation, cast salaries, extra talent, lunches and the rental of locations. For example, during the completion of *The Lives of a Bengal Lancer* the company had a large location approximately fifty miles from the studio. They were using between two and three hundred extra people a day and about a hundred and fifty horses, and these had to be transported back and forth each day. In order not to be forced back by bad weather while paying for the above, the production manager chartered an airplane, which left the airport every morning at four and flew over the location to determine the condition of fog, clouds and wind. The pilot was accompanied by the assistant director, and if both thought it inadvisable to shoot that day, they called the production manager and let him know. Their report was

checked against the local weather report, to be sure they were making the right move. For this picture, the system was very successful.

On some pictures a weather expert is hired from a technical school and sent on location a week ahead of the company. He sends in a daily report for the first three days, and an hourly report for the remainder of the week, thereby keeping the production office in constant touch with the weather conditions. This was done in *The Lives of a Bengal Lancer* to avoid a great amount of expense. The production office now always contacts the local airport each evening to get a detailed account of weather conditions for the following day.

The movie industry first settled in southern California because of the good weather and abundant types of locations. Within the radius of a hundred miles of Hollywood, deserts, ocean, lakes, rivers, forests, ranches, mountains and homes of any desired type may be found. Most large estates in southern California have been photographed and are on file in the location department.

Most major studios have a studio ranch. This is located within an hour's travel of the studio and consists of Western streets, New York streets, Chinese streets, South Sea Island villages, army barracks, railway stations, tanks for water scenes, and almost everything that cannot be built on the stages on the lot.

If a production has an out-of-town location, the unit manager, the location manager and the director go through the files and photographs in the location office to find a suitable site for the production. If none is found, they must go in search of one. If, for instance, the proper location is found in the northern part of the state, the unit mana-

ger must arrange for hotel and meals, as well as transportation.

If the location is too far from a city, a camp must be erected. There are several companies which cater to motion-picture locations. They furnish tents, cook-houses and all necessary equipment to take care of the company. If any night scenes are to be taken on location, generating plants must be provided to supply the electricity. The unit manager must be certain that the camp is well supplied with food, water and good sanitation. The camp is usually situated as near trees and level ground as possible, and is built on the order of an army camp with company streets.

Lights must be out at eleven o'clock, so that everyone will have a good night's rest, as the company works from sunup to sunset every day, including Sunday. First aid is furnished for the company's safety and welfare workers for children, if the company is on extended location. If animals are used, veterinarians must be supplied and water and feed located as conveniently as possible. Often the unit manager will be able to rent livestock from the surrounding ranchers and not have to transport them from the studio.

Projection machines and screens are set up on location, so that the director can see the rushes or *dailies*. If a town is near by, the unit manager may arrange to use one of the movie theaters after the evening show. The film shot each day is carefully packed and shipped to the studio laboratory. The reports of the assistant cameraman and the assistant director are mailed to the studio production office every day, so that the production manager will know how the company is progressing. The unit manager also telephones the production manager three or four times a week

to report progress. Quite often, in case of a mechanical breakdown of the camera or sound equipment, replacements must be sent to the location by air, train or truck.

Some studios have short-wave sets, so they can talk directly from location to the studio. For instance, during the preparation of the script of *The Lady Consents*, starring Ann Harding and Herbert Marshall, Miss Harding was in Honolulu on her vacation. It was necessary for the production office to talk to Miss Harding about story changes and wardrobe. To do this, Roy Hunt, the cameraman assigned to the picture, who is a short-wave enthusiast, contacted Miss Harding in Honolulu via the radio with very satisfactory results.

WATER SCENES: If the script calls for a storm at sea, people being washed overboard and parts of the ship being washed away by waves and wind, the desired parts of the boat are built in the tank at the studio ranch. Here overhead tanks are so situated that thousands of gallons of water can be released quickly or slowly by levers and reloaded in a few minutes by large pumps. These tanks are also equipped with diving bells for under-water work.

SPECIAL EFFECTS: Every major studio has a department which handles all the rain, fire, fog, explosion, snow, hail and similar special effects. For example, in the picture *Winterset*, a large area had to be covered by rain and fog. The rain had to start with a slow drizzle and turn into a downpour. This was achieved by overhead pipes that had a series of adjustable nozzles. The pipes, in turn, were connected with fire hoses to supply the amount of water needed. To keep the rain from drowning out the voices of the actors as it hit the hard pavement, the special effects department experimented with a wire mesh which was suspended a few inches from the ground, and could not be

seen by the camera. The raindrops hit this wire mesh and deadened the sound of the falling water. The fog was supplied by a combination of dry ice and mineral oil which was blown through a painter's air gun and came out as a thick fog. This was done before each scene began. The oil was heavy enough to hold the vapor and give the desired effect.

To protect the actors from this continual downpour in which they had to work for about three weeks, rubber suits were made to fit under their clothes. Each actor had four or five identical costumes so that he did not have to wear wet clothes for a very long time. This, of course, was a protection against sickness.

PROCESS: If *process* (also known as transparency and rear projection) shots are used, suitable backgrounds must be found in the film libraries, or a cameraman must be sent to the actual location to photograph the desired scenes. For instance, in *Winterset* the script called for two characters to walk across Brooklyn Bridge, and for one of the characters to leave the gates of Sing Sing to be joined by another character in a walking shot. To get these backgrounds, a cameraman was sent to New York with exact duplicates of the wardrobe the characters were to wear. He hired two *doubles* of the same size to walk in the long shots. The film was then shipped airmail to the studio laboratory in Hollywood, quickly developed and sent to the editing department, so that the producer, director and editor could see it and determine if the shots were satisfactory.

The film was then turned over to the process department and prepared for rear projection. This is done by projecting the background from the rear on to a transparent screen. The real actors are then photographed in front of

the screen. This gives the illusion that the characters were actually walking out of Sing Sing or crossing Brooklyn Bridge. When the characters walk in this type of scene, a treadmill is used, so that the actors appear to have the background move with them.

When all departments have turned in their budgets, they are assembled by the production manager, who now includes the studio overhead expense which sometimes runs as high as 40 per cent of the grand total. He then calls a general budget meeting of all the department heads, the director and producer, to determine how many days will be needed for shooting the picture and how much money can be appropriated. A final shooting schedule is sent to the various departments, while the production manager contacts the director in regard to cast, personnel, wardrobe and sets. The final shooting schedule includes *cover sets*, or scenes to be shot in case of cancellation of a call if the production is working on location, and is made up so that every actor has a twelve-hour rest between calls and thirty-six hours over the weekends. If children are used, they may only work from 9 A.M. to 6 P.M. daily, no Sundays, and they must have three hours of school during the day. Young babies may be photographed only a few minutes at a time, and nurses and school teachers are supplied by the studio. In the case of a nursing child, the mother is, of course, with the baby at all times; the studio furnishes a dressing-room for the mother and baby's comfort.

Then, while the various departments prepare and schedule, the production office through its contact man, the unit manager, stands by the director and waits for the signal

to start. Once that is given, the huge apparatus of the studio is set in motion and actual production begins. From the moment of the start until the picture is ready to be turned over to the distributing agencies, the task of the production manager is to see that all that has been planned, estimated and scheduled is carried out promptly, efficiently, and with the minimum of errors.

There is no other industry in the world in which the old adage "time is money" is so applicable as in the making of motion pictures. The slightest delay may cost thousands of dollars; a single misplaced prop may bring hundreds of people to a standstill. The motto of the production department is: "We can't photograph alibis." No department head would dream of reporting to the production office that he cannot fulfill an assignment or that something urgently needed is impossible to procure. No matter what the explanation may be, it is never acceptable.

If a property man has mislaid an important prop through carelessness or accident, and he can find none to duplicate it, another must be made. This takes time, and meanwhile it may be necessary for the company to move to another set, call different actors and even extend the rental of equipment and other props.

Bad weather, sickness or injuries to actors, or unavoidable accidents must never delay the company and hold up production. The unit would then be immediately transferred to another set where the injured or sick actor would not be required. Bad weather sends the company back to the studio where a set is prepared to resume the shooting of another sequence of the picture. And if, in spite of vigilance and forethought, mishaps occur which delay the unit, the production manager must see to it that the time lost is gradually absorbed, the lost money is compensated and

the schedule of the unit is brought back as close to the original estimate as possible.

Some of these delays can be avoided if the production manager keeps a careful watch over the daily schedule of each picture. If, for example, a company is shooting on a set for which six days have been allowed, the director can ascertain by the second or third day whether there is a possible chance of running overtime. If this is the case, it would be advisable to work a few hours every night to make up the loss, or to make whatever changes are necessary by shortening the number of scenes on the set. If it is the crew who have held up the production, they are replaced. This applies to the director also. On the other hand, if a picture has been in production for three weeks and is four to five days behind schedule, the producer may decide that he will have a better picture than he expected and will quite often have more money appropriated to the budget, and make no changes in the story, crew or director.

The production manager must make sure that actors and actresses under contract to the studio are finished on the date scheduled, as they may be working in two or three other pictures at the same time. Any delay here may seriously hold up the production of other pictures.

Day and night, week after week, year in and year out, the production manager has three to ten productions running simultaneously. Through his office millions of dollars flow, thousands of people are employed and their activities supervised, immense amounts of material are bought and used. All manner of errors and accidents must be eliminated, adjusted and tracked down, all this so that our industry may turn out better pictures at greater economy and, finally, that our craft may achieve greater perfection for the enjoyment of millions of people the world over.

VI

DESIGNING THE SETS

Hans Dreier

THE WORK of the art director starts with the synopsis or outline of the screen play, which gives him a general idea of the locale, atmosphere and scope of the picture. His first conference with the producer is based on the ideas he has formulated after reading the synopsis. At this time also, he submits a rough estimate of the necessary sets, their cost and the stage space required. Later, when the first draft of the shooting script appears on his desk, he elaborates on his earlier ideas and makes a more detailed plan of the sets.

He must consider a number of factors in making this plan: the sets must be designed to enhance the mood of the story, to encompass all the action required by the script, and to be absolutely accurate in details of period and country. In regard to the latter, it makes little difference whether the story calls for sets representing the habitat of Neanderthal man or the bedroom of Napoleon at St. Helena or the modern penthouse of a wealthy bachelor. Each must be correct. Audiences today are becoming more and more discerning. Much money and labor go into securing the necessary research from which the art director fashions his plans. Museums, private libraries and university research departments are utilized in the pressing search for

correct answers. Of course, all major studios have their own research departments, and ordinarily they are able to supply pictures and descriptions of historical periods and styles sufficient for the majority of films. But occasionally problems arise in a story which cannot be settled by the research department. In this case the art department sends photographers to museums and libraries to photograph pages of rare manuscripts dealing with the period in question.

Another important consideration in planning the sets is the problem of adequate lighting. Some sets require brilliant and glittering lights, while others require subdued lights, depending on the action and mood of the story. For brilliant lighting the art director must employ schemes of material and color which will create a mood of brilliance. Here the construction of the walls is also affected, because they will have to support many more lights than ordinarily. For a low-lighting scheme, the art director should plan a hazy and indistinct background, which will heighten the ominous or somber mood.

At this stage the personnel of the art department comes into the proceedings. The department is headed by the supervising art director, who prepares the designs of the settings in the way previously described. In further discussions with the director, the designs are completed up to the point where the assigning of a unit art director becomes necessary. The unit art director, who is an artist of individual style and achievement, takes charge of the designs from now on. He also contributes his personal conception and creative ability to the production. His work is of great importance because he has to combine art with practical knowledge and executive ability. The major studios each have an average of ten unit art directors.

Now the unit art director prepares a layout which includes sketches of every set in the picture and elevation drawings drawn to scale. Sometimes these sketches are insufficient if the director has no architectural imagination and cannot visualize the finished set. Then watercolor sketches are made which will include the proper lighting of the set, so that the director and the producer will know how the sets will look when built. In complicated layouts, in which several rooms, streets and gardens are to be built as one unit, models of paper pasted on wood are made from the preliminary drawings. These little models serve several purposes. The director can plot his action and shots more correctly. The construction department will have an accurate idea what is required of the set, and the set dressing department will know more definitely the requirements for the furniture.

Assisting the unit art directors in their work is a force of designers, draftsmen and artists, whose number varies with the amount of work to be done. Most art departments keep the most valuable of these on a permanent basis. The designer's work is mainly to prepare the working plans of the sets. To be successful in this vocation, he must fully understand the style and intentions of the art director and have creative ability of his own besides. Full-sized details and an estimate of the cost, given by the construction department, round up this phase of the work and the plans are ready for blueprinting. These blueprints are then sent to all departments.

An important factor in planning the sets is the availability of floor space on the various stages. Since the advent of sound, two units can no longer work on the same stage. The space must now be plotted according to the shooting schedules of all pictures in production. As this

involves actors, directors, time and many other items, stage space is allotted by the production manager, who keeps in constant touch with the supervising art director, who, in turn, must plan his settings for all productions with the available floor space in mind.

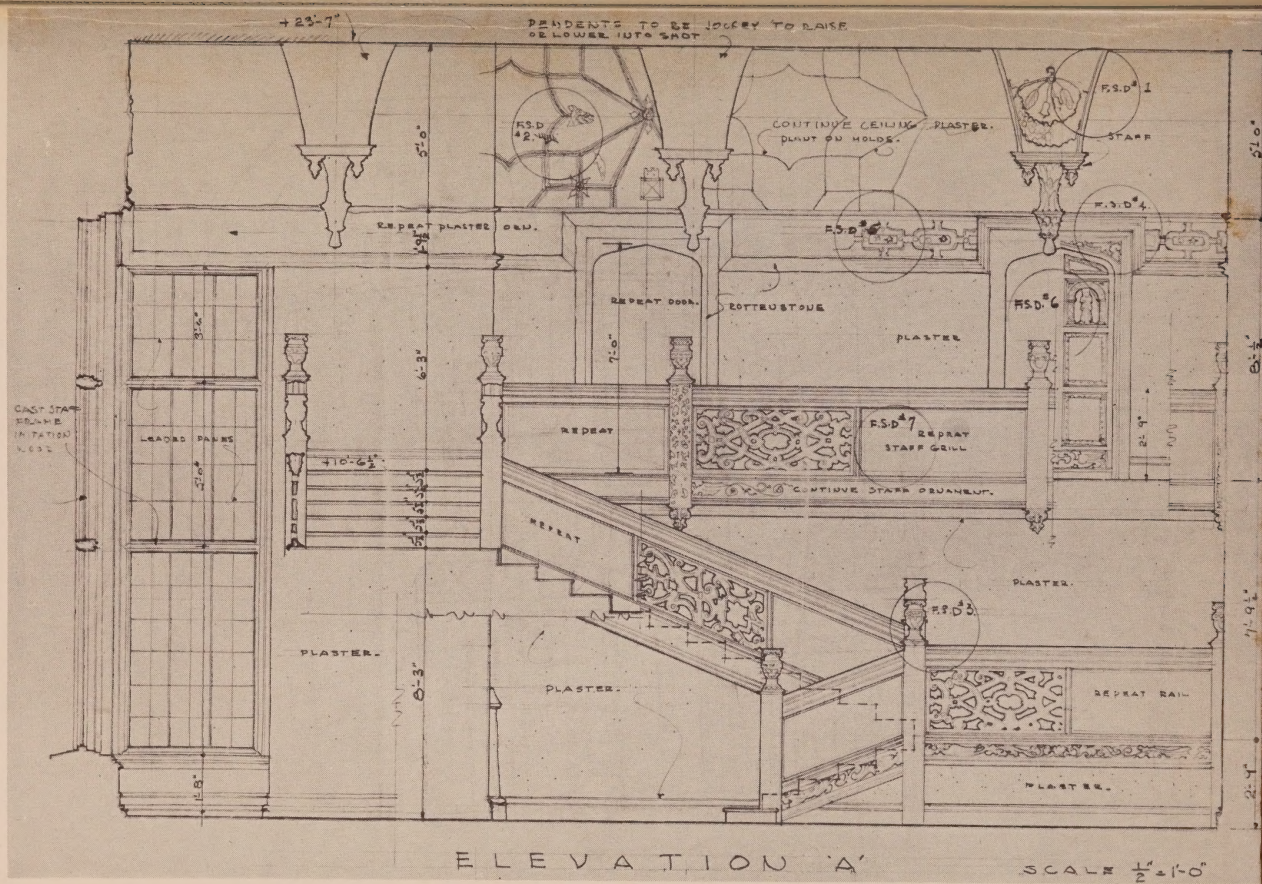
As the production of the picture proceeds, the unit art director discusses his plans with the supervising art director, who approves them and assumes the final responsibility for them to the production head. To prepare a set plan for final approval, the unit art director must consider a variety of angles. With the guidance of the final script, he carefully scrutinizes each set to determine how much of it must be constructed to cover the action of the scenes. For example, if the script calls for the "Interior of the Ritz Hotel Lobby," when the action consists of a desk clerk answering a telephone call, only the information desk need be built. When the scene calls for a close-up of the clerk answering the telephone, only a small portion of the information desk need be built. This is such a simple case that there would be no need for discussion. A more involved example would be one in which the camera precedes an actor walking along, then swings away from him to point out a person in another part of the room. Such a set-up sometimes means the construction of large sets which are subsequently overlooked, because the camera is so close to the actor that everything else is out of focus. Such a scene is carefully discussed by the producer and director, and they will have to decide whether or not this particular way of shooting the scene is so important for the telling of the story that the set expenditure is of minor importance. In other cases the script might not call for a large set. But to carry the mood of the scene convincingly, the art director may feel that the opposite procedure is

necessary here. He will then have to obtain the approval of an expenditure which was not originally anticipated.

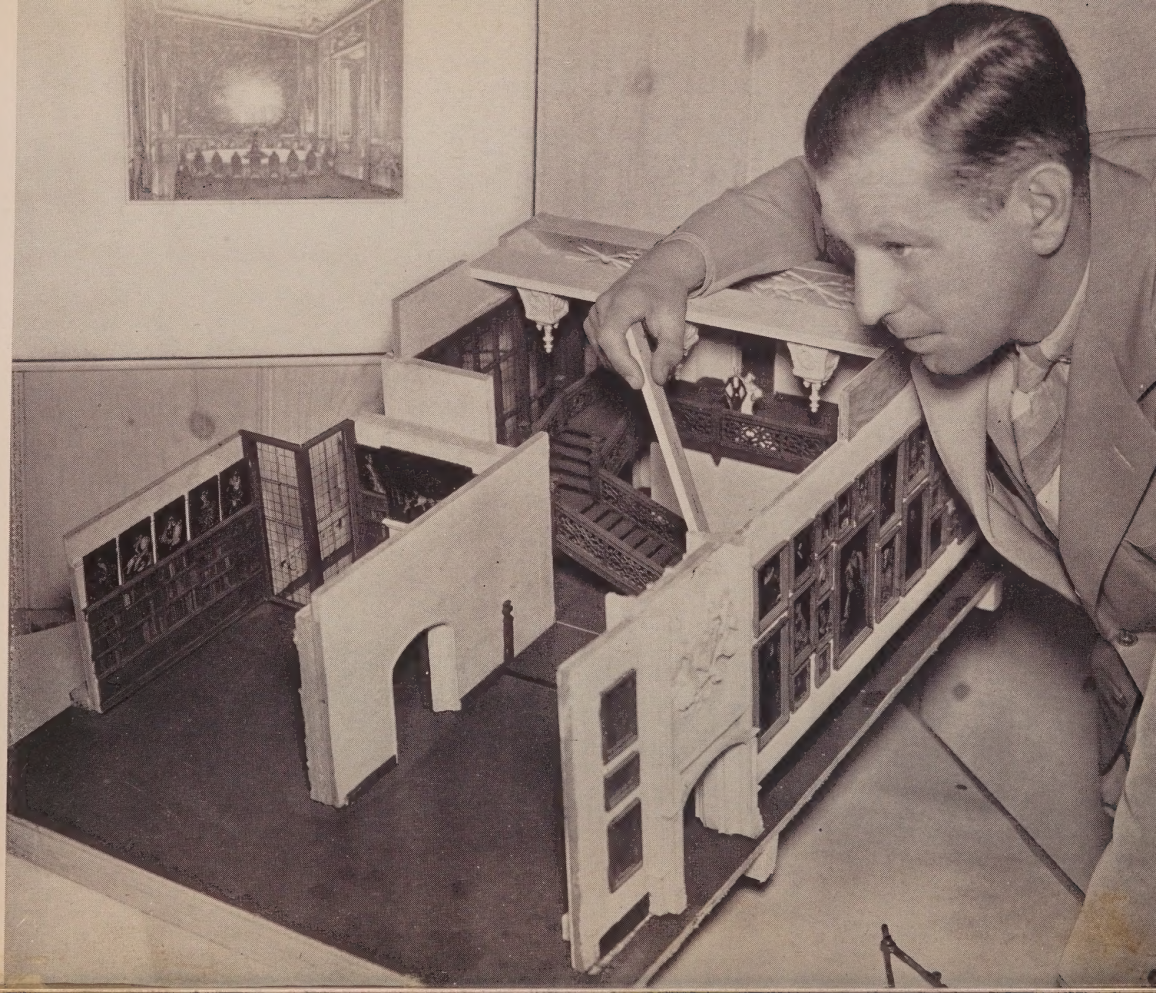
A thorough knowledge of all tricks which are made by the special-effects department is essential to the art director. For, although the sets may look real to the eye in the finished picture, they are still part of the illusion created for the audience. Part of this illusion may be made by distant backgrounds, which—especially on interior sets—are created by the art director with the help of the special effects department. Since the audience cannot discern any individual action in distant parts of a setting, the illusion of scope and depth can be created by reducing the scale of certain parts of the set to miniatures, placing these in back of the set (background miniatures), or in front of the camera (foreground miniatures). The latter procedure is based on simple mathematical facts; it enables the art director to construct only the lower parts of the settings, in which the action takes place, and to carry the illusion of great distances above by means of construction on a reduced scale.

Backings are also handled by the art department. If a scene is laid in an office building, say on the sixth floor, the backings of other office buildings seen through the windows are necessary. These are made from 9 x 11-inch photographs and enlarged by process photography to the necessary perspective. If the script calls for a night scene, apertures are cut in the windows, covered with tracing paper and lights placed behind them. If roof-tops are needed, small electric and neon signs are built in the proper proportion by the miniature department, under the supervision of the art department.

The approved set layouts must now be translated into actual working plans, from which estimates are then made.



A set plan of the hall staircase showing details of the woodwork used in the construction of the sets for "Angel." (Courtesy of Paramount Pictures.)



Hans Dreier examining his set model for the hallway and adjoining rooms of the English manor house used in the production "Angel." The model helps the director, Ernst Lubitsch, plan his action and camera angles. (Courtesy of Paramount Pictures.)

These must closely approximate the budget which the supervisor has made in his previous plans. This budget has been approved in a production meeting presided over by the producer, director and all department heads involved in the actual production. Then, when the new plans and estimates are completed, the building of the sets begins under the supervision of the unit art director.

Now the set dressing department swings into action to provide suitable furnishings for the sets. This department functions under the supervision of the art director in charge of interior decoration. According to the sketches, the set dresser collects the furniture, drapes, rugs, pictures, lamps and whatever additional accessories he thinks are necessary. All major companies have a large stock of furniture of all periods and styles. But the variety of requirements is so great that no company can buy and keep all which is needed. The very foundation of the industry—novelty of entertainment—acts against anything too permanent. Characteristic pieces cannot be seen too often without being recognized. Large furniture houses keep an ever changing stock for the decoration of the sets, and put them at the disposal of the studios on a rental basis. Sets of unusual or novel design require special furnishings to blend in with the style of the setting. The art director provides his own designs for such furniture and accessories, which are to be executed from the working plans of the art department. When the art director has passed on the finished sets, the set dresser notifies the various other departments which must perform their tasks. Then the set is turned over to the director and the production begins.

Although the requirements of the script and the intentions of the producer and director are the main guides

in the design and construction of the sets, other departments demand consideration. The most attractive set is worthless if it cannot be photographed. Basically, a set is lighted from the top of the walls, thus excluding the use of ceilings. Since outside of the make-believe of the set there is no room without a ceiling, the impression of one must be created by other means. Shading the upper portions of the walls by lighting is one way, a miniature ceiling another; sometimes a portion of the ceiling or a row of beams will create the necessary illusion.

The problems of the art director in selecting colors are again closely related to those of the cameraman. Since the majority of pictures are still photographed in black and white, the colors chosen must create a perfect harmony in their black and white tones and still be pleasant to the eye. The psychological effect of a set strongly disharmonious to the eye, although photographically perfect, should be considered for the benefit of actor and director. In sets which are photographed in daylight with infra-red filters to create a night effect, all tones are painted in shades of bluish-gray, because all colors with red in them will appear photographically very light.

Sound also must be considered. The microphone is suspended on a movable boom, which is a prescribed height from the floor. This determines the height of the doors or arches, so that the boom can still pass under them when the camera precedes the actors in a trucking shot in which the camera approaches the subject by having the tripod on wheels. But construction materials are now so well standardized for sound that this problem has been practically eliminated for the art director.

The construction department is most closely connected with the practical work of the art director. Since we only

see the images of sets on the screen, the construction of sets is based on principles entirely different from those of the building trades. A set might appear to be constructed of heavy stone roughly-hewn; actually it is made of studs sufficient to hold up the heavy-looking front. The stones are cast in plaster from the surface of real stones, but are hollow in back; in cases of great weight they are cast in papier-mâché. A large variety of imitation materials are used, wood and marble photographed on paper being two of the most commonly employed.

If the script calls for an elevated set, that is, a set like a theater balcony, the head of the construction department estimates the amount of lumber and steel needed for the framework, so that the set will be strong enough to withstand the strain of a balcony full of people. This type of set must be built in accordance with the insurance and state building laws.

The art director must also contend with the problem of the safety of the sets. This does not mean the ordinary construction safety, which has already been provided, but the safety of the many trick effects to be used on the sets. Suppose a script calls for a fire to break out in a room, or for an explosion to occur. It is true that the material employed for such effects is comparatively harmless. But harmlessness is not enough. The widest possible margin must provide for the construction department to cope with all difficulties. The walls and backings must be fireproof, and the sets must meet the rigorous fire laws of the state. The ventilation outlets must have been indicated in the plans, and pipes laid for an additional water supply.

If a ship has been built so that it may be wrecked during the shooting, the exact force necessary to wreck it must have been computed beforehand, because it is practi-

cally impossible to retake the scene. All walls, boards and railings which break or fly through the air are carefully placed to insure the minimum accident hazards. In short, the art director must constantly co-operate with the various departments so that the sets will be safe for any shot demanded by the script.

There are many other departments which help in the execution of sets. All major studios are practically self-sufficient in crafts. They have complete foundries, machine shops, electrical and engineering departments, draperies, furniture, properties, printing shops and metal works. All of these have only one purpose: to make illusion look like reality. What they produce has no other value than a photographic one; what they manufacture cannot be sold as a product in itself. Only on the screen do these things come to life, carry conviction and look unquestionably right, whereas off the screen they look like odd contraptions.

The electrical department has a special unit which works independently of the unit which lights the sets. It has charge of all fixtures, wiring and switches in the set which are seen but not used. Sometimes a script calls for *practical wiring*—that is, when the action of the scene calls for an actor to switch on the light. Here the light would go on, but at the same instant heavy lights concealed above or around the set would also be lit. This would give the illusion on the screen that the only illumination of the set was made by the actor. The electrical department must also carefully match the various lighting accessories to the period of the furniture. For example, the wiring and switches of a Dutch home in 1900 would be quite different from anything we use today.

The drapery department works directly under the set

dresser, and employs a number of women who make up the drapes and curtains for the sets. Very few of these drapes are stock drapes, because each set demands a particular atmosphere to which the curtains and sets must conform.

The art department is one of the first of the studio forces to come in contact with the story during its preparation and is one of the last to leave the production. Prior to the actual shooting, the sets must be designed and constructed. During production, the unit art director stands by for possible changes or emergencies and supervises the construction of additional sets as they are built. When the actual shooting is over, the art director checks on the final order to *strike* or demolish the sets, with parts preserved for possible future use and all furnishings returned. He must know every set and its component pieces in order to preserve the most of each; or, if the set lends itself to easy remodeling for another currently contemplated picture, he must know the necessary changes to be made.

In short, the art director is responsible for creating the reality of the backgrounds, against which the characters in the story move, so that an illusion of the screen world may be preserved.

VII

ON THE SPOT

Robert Edward Lee

THE assistant director might well be termed the liaison officer of the production to which he is assigned. He might equally well be termed the director's mouthpiece, for that is precisely what he is.

His office is the clearing-house for the production, and from it—and him—emanate all the data, the requisitions, the orders that start the huge studio wheels and the wheels within wheels, and keep them turning until the production is finished.

From the moment the production office assigns him to a picture and tosses a script into his lap, the assistant is "on the spot"—and in more ways than one. His is a thankless job at best. He must be constantly on duty, not only during the day but at night as well, as practically all set construction and set changes are made at night, thereby avoiding the unnecessary and costly delays to units shooting during the day. The first to reach the studio in the morning, he is the last to leave at night. But the days are too short in which to accomplish his many tasks; consequently each evening finds him planning, plotting and scheduling for tomorrow.

His, also, is the task of explaining to department heads precisely what the director wishes. In this he frequently

finds himself on that well-known spot again. He must be the world's champion guesser, especially when attempting to translate the precise meaning of some cryptic phrase the director has hastily thrown over his shoulder in answer to a perplexing question. He must know the director's exact meaning. This question might involve the height of Miss Dietrich's heels or the manner in which Clark Gable's mustache is to be trimmed. It is up to the assistant to see that the director's wishes are faithfully and meticulously carried out. This frequently requires finesse. A good assistant must be a combination of a finished diplomat and a tough, hard-boiled army sergeant, knowing when to cajole and when to revert to more down-to-earth tactics.

Let's go with him and see precisely how he operates —and why.

The script has arrived. It is the final version. As it now stands, with the exception of minor changes in dialogue and action, it will be shot. The sets, the characters, the major props and sequence of action will not be materially affected by any slight deviations the director might make on the set. The production office wants a breakdown immediately. So do the various department heads. They all have copies of the script, but until they receive the assistant's breakdown they toil not, neither do they spin, at least not as far as this picture is concerned.

A breakdown is precisely what its name implies: a breaking down or itemizing, in minute detail, of the requirements of each and every department in the studio. Nothing is too small, too commonplace to be omitted. Nothing is left to the imagination. Everything needed for the production is included down to the last detail. This breakdown informs each department exactly what it will

be required to furnish throughout the entire production, with full descriptions and quantities enumerated. It is the studio Bible.

The studio is waiting for it, demanding it. Cost estimates by each department must be formulated and submitted to the production office. They will not be made up until the breakdown is received. Certain props may have to be manufactured, materials ordered from afar, and many other items obtained, all of which involve the expenditure of both time and money. It is not only essential but vital that the assistant director produce it as quickly as possible.

With his assistant he starts. The first of their chores is a SET LIST, which includes all the sets in the production separated into two groups: INTERIORS and EXTERIORS. Each set is followed by the word DAY or NIGHT or, as it sometimes happens, by both, signifying when the action in the story takes place. They are further qualified by the notations STAGE, BACK LOT or LOCATION, denoting where this particular set is to be constructed or, if already standing, is to be revamped or shot as it is. This list is primarily intended for the departments most intimately concerned with the construction and dressing of the sets.

Then come the actors and actresses. They will be grouped under three major headings: CAST, BITS and EXTRAS. This list is basically of interest to only two departments: the casting and wardrobe. The former procures them and the latter dresses them. Under the division labeled CAST will be the star or stars and the more prominent supporting players. The assistant has little, if anything, to do with the selection of the cast. This is invariably done by the producer, the director and the casting office.

Now he is ready for the COSTUME or WARDROBE PLOT.

This plot is extremely valuable, and considerable care is exercised in its making. It is an effective means of preventing a player from appearing in the wrong costume, thereby getting a howl from the audience and a line in the "Movie-Boners" column. This COSTUME PLOT is a complete résumé of all costume changes for every actor and actress in the production.

In the average motion picture, the star, if a woman, will have from ten to twenty changes of wardrobe. These changes are governed by the sequences in the script. Each sequence normally ends with a *fade-out,* denoting a lapse of time, and each player, male or female, appearing in more than one sequence must have a different costume for each. Frequently, in the case of an actress, the addition of a coat or wrap makes one of the changes, while in the male ranks a different shirt or even necktie accomplishes the same end.

Costumes are invariably designed and made for the star and, usually, for the feminine members of the supporting cast. The male members of the cast supply their own wardrobe, unless it is a period production when clothes will have to be furnished to them as well. The assistant cannot claim fashion design as one of his many attributes, consequently he confines his description of feminine wearing apparel to a mere statement of type or the purpose for which it is to be worn, such as: evening gown, street outfit, pyjamas, sports outfit for the beach, leaving the design and making in the capable hands of the wardrobe. He will make a notation, however, when two feminine players are to appear in the same scene, to prevent the wardrobe from dressing them in similar patterns or colors. It is a simple matter to make up the plot for the male players, as their clothes are more to his understanding.

Each costume change is numbered: No. 1, 2, 3, and so on. Number one will embrace all the scenes from scene one through scene forty-five, number two will include all the scenes from scene forty-six through scene fifty-seven; and so it continues until the entire script is covered. Thus it is a simple matter to check the costumes to be worn by merely referring to the scene numbers in which the actor appears:

Now follows the most important classification: the SHOOTING BREAKDOWN. This is, in effect, a short summarized version of the script, incorporating every essential detail of each set in the production. One page or more will be devoted to each set. This BREAKDOWN will include the following data:

NAME OF SET:	With the number of the stage or the location where it will be shot.
SCENE NUMBERS:	Of all scenes taking place in this set, the designation of the sequences, together with the number of pages of dialogue.
CAST:	The names of each member of the cast who appear in this set; also the number or numbers of the costumes they are to wear.
BIT and EXTRA PLAYERS:	Each listed specifically, with the number of actors required and the wardrobe to be worn.
SPECIAL PROPS:	To be carried by the actors, or placed on the set. Also animals, conveyances, break-away chairs, clocks, mirrors, etc.
MUSIC:	Everything pertaining to music: direct recording, clearance on songs to be used, musical supervision, etc.
EFFECTS:	Rain, fog, snow, wind, process shots. Anything to gain an effect other than normal.
CONSTRUCTION:	Important data for construction department: break-away doors, candy glass for

windows, practical running water, jockey walls, practical fireplaces, miniature work.

MISCELLANEOUS: Every item of importance that cannot be classified under one of the above headings.

It can easily be seen that this breakdown covers the script in a minute, though extremely condensed, fashion. Each department, at a glance, can gain a thorough knowledge of the requirements for the set in question. It is their guide. While the production office sets the starting date, it is the breakdown that sets the studio wheels in motion, starts the activity that will continue until the last scene is taken. It sends wardrobe girls from shop to shop selecting silks, woolens, shoes—anything and everything for costumes: property men scurrying about for rare or odd props and furnishings. It prompts casting departments to line up actors and actresses; it speeds location men hunting for locations. It is the starting gun in the big race.

From the breakdown, with its infinite attention to detail, the assistant will make up the shooting schedule. This schedule gives the list of the sets in the order in which they will be shot, the actors appearing in them, the number of scenes and pages of dialogue, and, more important, the time required to complete each set.

The shooting schedule is, to the assistant at least, the one grand headache of his preparation for a picture. The angles involved, and they are many, force him to change the schedule time without number until he has, at last, satisfied everybody and every department.

Time is the essence of motion-picture costs: consequently the assistant labors to make a schedule entailing the fewest number of days possible to complete production. But the snags are varied and sundry.

First the director has to be considered. Can he shoot

out of continuity, and how much—and still get a good picture? Can he jump all over the script, a portion of one sequence here followed by another there, and when the finished product is shown on the screen will it be good box office? After all, there is little use in making a picture if it is to be doomed by a shooting schedule.

Second, will the sets be ready, and the costumes, and all the odds and ends entering into the making of a picture? Will the actors be available on the dates needed? Will there be other pictures in production that will interfere with this one in the matter of stage space or taxing the physical production layout of the studio too heavily? Will the music, if it is a musical picture, be recorded in time to permit playbacks to be used on the set? These questions must all be answered before the assistant can hope to make up a shooting schedule.

He goes scouting for information. The art department, the wardrobe, the casting office are, as far as he is concerned, the major departments in the picture. He asks them all the same questions. When will the sets be ready? What date can you deliver the costumes? Will these actors be available on the dates specified? If not, when?

Armed with this data, he makes a tentative schedule, hoping against hope that it will meet with the approval of the production office. Wrong again! There he encounters more reasons which necessitate new changes. More juggling of sets and dates. Small wonder he finds the shooting schedule such an arduous task. But perseverance wins out. Ultimately, usually just before the first day of shooting, he has formulated a schedule satisfactory to all concerned. He is happy again.

And now with most of the paper work out of the way, he settles down to the other details of production prepa-

ration. Make-up and hairdressing tests for his principal characters must be made before the production starts. The assistant supervises the tests. Costumes must be fitted, and passed upon by the director. If animals or conveyances are to be used, they must be paraded in front of the director, giving him the final choice in their selection. And the same holds true with every important prop and element that will be used in the picture.

Bit players must be interviewed, passed on to the director and, if found satisfactory, properly costumed. Extras must be seen and chosen. A staff must be assembled: cameramen and their assistants, sound men, script clerk, property men, grips, and the score of technicians invaluable to any picture. *Sides* or pages containing their lines must be struck off and given to the actors. Stand-ins must be selected for the principals, physical examinations for the cast. Locations and costume sketches must be shown to the director for his approval. These are merely a few of the aspects of preparation. There are so many there is not sufficient space to enumerate them. But, needless to say, the assistant does not find time dragging heavily on his hands.

Finally the fateful Saturday arrives. Pictures usually start on Monday. The assistant makes out his call sheet and posts it early in the forenoon. The call is "Ready on the set, 9:00 A.M. Monday," followed by the name of the set, the stage number, the actors needed, the costumes they wear and notice of hairdressers and make-up people needed. To the casting office he sends the slips denoting the starting dates of the principals, and a requisition for the bits and extras.

The rest of the day he spends in checking the things needed for Monday. Is the set dressed? Has the director

seen and O.K.'d it? Are all the props ready? He tries the doors and windows of the set, to see that they work properly. Are the electricians all rigged and ready to go at nine on Monday? Does the floor creak? He tries it. Is the fireplace practical and has the plumber been notified to operate the gas in it? And, by the same token, has the fireman been ordered to stand by with a fire extinguisher? Is the star's portable dressing-room on the stage? Does the water in the sink drain out quietly? Has the script clerk a stop watch to tell the footage of a scene by the time it runs? Are the cast chairs ready with their names on the backs? Is the camera boom ready and the track laid? Does the sound department know the first shot is a boom shot, so they will have their *mike* on roller skates? Have silence pads been fitted to the actors' shoes —strips of felt glued to the soles and heels? Did casting get in touch with the bit actor needed—the one who went to the beach for the day? Has the star's wig been delivered? Have costumes been delivered to the dressing-rooms and dressers ordered for the principals? Has make-up been notified to use two points darker make-up on the *heavy?* Does the *gaffer* know there is a light change in the first scene so he can arrange his switch boxes accordingly? Has the piano on the set been silenced and music notified to have a recording piano and pianist off-stage? Has the porcelain jacket for the star's tooth been finished? Have the pictures on the set been gauzed down? And so it goes—nothing is too small, too insignificant to escape the merciless checking.

It is late when he finally leaves the studio. He is worried. Things are going altogether too smoothly. Something is wrong—something must be wrong—because, apparently, nothing is wrong. Nothing seems to have been overlooked,

and that is unusual. Mentally he goes over the routine checking again. Everything seems to be set for the jump-off on Monday. Well, Monday will tell the tale.

Tomorrow will be his last day of relaxation for six long weeks. The last day he can call his own, as the normal picture averages six weeks in production. Six weeks in which he will be a stranger to his family and his friends, six weeks in which his waking and sleeping hours will be devoted to the studio and the production just starting.

No industry in the world demands and, incidentally, exacts such long hours, such singleness of purpose and thought, such doglike devotion, as the movie industry. From the first day of production to the last, the thought uppermost in everyone's mind is—the picture. And that holds true for everyone connected with the actual production.

Bright and early Monday he is in the studio. More checking. On his way to the set he stops in at the dressing-rooms of the various actors, who, by the way, are usually in the studio by seven in the morning for make-up. He finds them in various stages of make-up and dress. In the women's building hairdressers and make-up people hover about. Girls are under driers, having lips done, make-up base applied, powdering, or in the throes of getting false eyelashes. Everything seems to be going nicely, and, in the background, wardrobe girls are awaiting their chance to slip on the dresses. The feminine portion of the cast will be ready on time. Then to the men's quarters. Here, too, everything seems to be under control save for a false mustache or an obstinate hair-piece. So far, so good. Now for the set.

The set is chaotic. Set dressers, electricians, grips, sound men and property men clutter the sound stage. It is the

first day's turmoil and is to be expected, as the crew is strange to one another. It will take a few days to settle into the harness and pull together: to function as a unit rather than as a score of individuals. Fully realizing these chaotic first days, the assistant has allowed for it in his shooting schedule and mapped out a rather light day for the start.

By the time the director arrives chaos has given way to a semblance of order. Cameras have been set up, sound channels tested, props checked and the actors called from their dressing-rooms. It is now up to the director to stage his action and, as the huge stage doors slowly close, all is in readiness for the first set-up.

Cameras are placed and the first rehearsal is under way. After he has staged the action to his satisfaction, the director takes the principals offstage to run through their lines, making such changes or corrections as he desires. The assistant, for benefit of cameras and sound, holds a rehearsal, but with the stand-ins instead of the principals. The same walks, the same stops, the same turnings, in fact everything the principals have done except the reading of lines, is rehearsed in slow motion. Ultimately lights are satisfactorily set, focuses obtained and mike positions ascertained. Everything is ready for a take. One more quick rehearsal, this time with the principals, a final checking of make-up, a loud shout of "Quiet" and the red lights are on. The cameras begin to turn and soon the first scene will be history. The picture has actually begun.

It is not, however, as simple as it reads. Many elements—far too many for the assistant's peace of mind—enter into the completion of a good take. The most insignificant trifle can mar or make a scene. A fly, for instance. Should it alight on the face of an actor, the irate director will

Shooting a scene on location from "The Gay Desperado." The stage helper, the sound mixer's assistant, has improvised a microphone boom from a fishing pole to record Leo Carrillo's voice. The assistant cameraman has brought the two clap boards together over the signal board to synchronize sound and picture. Seated next to the camera is director Rouben Mamoulian, and standing over his left shoulder is Robert Lee, the assistant director. The two arc lights are "booster" lights used to eliminate deep shadows. (Courtesy of Pickford-Lasky Productions.)

scream "Cut" and, as he reproachfully eyes the assistant, a property man rushes in and fills the set with Flit. When the mist has cleared the scene is begun again. Or in the process of a take, the Goodyear blimp roars over the stage, its motor noise cutting through the actor's lines. Before the director can yell "cut," the assistant is on the stage phone, frantically imploring Miss Lola to radio the blimp to leave the vicinity of the studio. The blimp pilot is Miss Lola's boy friend. And as the motor noise recedes in the distance, once again the scene is resumed.

Perhaps they are shooting a scene from the middle of the story. It is the rare exception, rather than the rule, to shoot a script in strict continuity. The scenes just preceding and those immediately following have not been taken and, in all probability, will not be taken for weeks to come. The scene has been rehearsed, shot, and the prints O.K.'d. But everyone on the set overlooked one thing: the actor should have made an exit wearing a white boutonniere, as there is business with it in later scenes. The show stops when the mistake is discovered. The director looks askance at the assistant; it is the assistant's fault, as the director is occupied with more important matters than matching a little prop. When the property man comes back, breathless, with the forgotten flower, the scene is reshot. And so it goes: rehearse and shoot, rehearse and shoot, all day and every day until the production is finished.

The bane of an assistant's life is location. To most of the troupe it is a picnic. The fresh air and the sunshine, in marked contrast to the stuffy suffocation of a dark sound stage, is a welcome and pleasant change indeed. But not to the poor assistant director. Shooting in the studio, with its marvelous facilities at his fingertips, he still encounters

countless difficulties: but location, miles away from the studio, is nothing less than pure grief. He is too far from his base of supplies. He is constantly finding himself in the predicament of the mocking-bird—"out on a limb."

Location adds an incredible number of duties and a thousand new worries to those commonly occurring when shooting in the studio: transportation, hotels, if an overnight location, lunches, hordes of visitors, sanitary arrangements, changeable weather and a score of details too numerous to mention here. On location his functions are not merely those of an assistant director: added to them are the duties of every department head in the studio. He obtains sites, builds sets and dresses them, hires laborers, employs extras, buys and rents props, and makes practically every arrangement to expedite the completion of the work mapped out for this location.

A unit on location is strangely reminiscent of an itinerant circus touring the small towns. With its battery of trucks, usually six or eight, for props, lights, grip equipment, cameras, greenery, livestock and sound equipment, the huge sound truck, buses for the extras and limousines for the staff and cast, it is a fast-moving, self-contained mobile unit. And it is safe to say that no circus has ever attracted more interest and, certainly, no more visitors. From the time the cameras are set up until the last shot, there is a constant throng of curious sightseers, bubbling over with a million questions. It is then the assistant calls upon all his diplomatic powers, as it is he who must handle this crowd, keep them quiet, and prevent them from interfering with the work to be done. More frequently than not it is quite a task.

On location, vastly different from the studio, he has a relentless and tireless adversary—Nature. The sun, un-

fortunately, will not stay put, and the changing light forces him to do a sleight-of-hand juggling act with the shooting schedule to meet the ever changing conditions. Morning light will be necessary for certain scenes, while others definitely demand the afternoon sun. This frequently necessitates actors changing costumes three or four times in a day and a new deal all around for set-ups, props and action. Or a bank of white billowy clouds roll in. He at once changes plans again to take advantage of them or, to eliminate them, goes into close-ups. And Nature does not rest here. She sends the fog, the wind, the rain or the dust, birds singing in the trees, crickets chirping in the brush, deep-voiced frogs croaking in the ponds, anything and everything to harass a troupe on location. For every whim of Nature, the assistant must have a counterplan at his very fingertips. The old saying, "The show must go on," is never as fraught with meaning as when a company is on location. Sometimes he loses in these jousts with Nature, but it must be said, and to his credit, his victories far outnumber his defeats.

In the studio or on location the assistant is, directly or indirectly, responsible for everything happening on the set. There are but two exceptions to this: the direction —and the performances—of the principals. These are in the lap of the director alone. But all else: delays of any kind, interruptions of shooting, failure of equipment or man power, actors improperly costumed, make-up or lateness on the set, bits and extras unable to do what is required of them, or anything forgotten, no matter by whom; all this is laid at the door of the assistant. An assistant has never been right but once—and then he was wrong.

He must be a dry nurse to every member of the unit

and, on some occasions, more than that. Frequently he must handle the purely personal trials and tribulations of his director and cast, so their minds may be eased of all earthly troubles and devoted exclusively to the artistry demanded of them. He must be a Father Confessor, a fluttering Dove of Peace and a one-man Advisory Board rolled into one.

He must be versatility itself and a master of many accomplishments: equally proficient in lulling a crying baby to sleep or silencing a braying jackass; as familiar with the households of the upper strata as with those of the slums; and equally adept in handling a temperamental star or nursing a ten-ton truck through a bog.

His sense of discernment must be keen and his nose for impending disaster acute. Quick to recognize the foibles of his director, he wards off and weeds out the many annoyances that might tend to affect the day's work. Should an actor suddenly be taken ill, he invariably has a plan conceived and waiting for just such an emergency, that will permit the unit to function with a minimum loss of time.

The producer has been likened to a field marshal and the director to a general, in which case it makes of the assistant the company commander; and he is always found, where a good captain should be, on the firing line. He is the co-ordinating force of the many and sundry physical elements necessary in making a picture; he must blend the component parts into a harmonic whole; and it is his skillful blending and wise co-ordinating that maintains the production on schedule and sends it out into the amusement world with an even chance of winning honors as entertainment and, what is more important, as good box office.

The assistant is answerable to two superiors, both of whom, incidentally, are hard taskmasters—the director and the production office. To please both is a difficult yet compulsory task. The artistry of the director is, usually, at great variance with the ideas of the cost-conscious production office. Artistry, in this day and age, is not by any means a cheap commodity: it demands time, time is money, and production costs mount with amazing rapidity. Consequently the assistant is constantly between two fires: allied with the director one moment and with the production office the next. But in either event, and quite regardless, he is sure of one thing: he is certain to be "on the spot."

VIII

THE PLAYERS ARE CAST

Phil Friedman

THE job of the casting director concerns that very personal element in the industry: acting talent. He must see plays, he must interview thousands of actors and actresses, and he must cast every story except for the stars, who are customarily chosen by the director and the producer. In this he is aided by a battery of assistants, whose work he supervises in choosing the lesser players. He must act as agent between his and other departments. And always, his selections for each production must meet with the approval of the head of the studio, the producer and the director.

When the story is in its formative stages, the casting director receives a brief outline so that he knows what characters will be necessary and can make his suggestions for the players accordingly.

When the script is ready, he receives his copy. From the breakdown of the assistant director, which lists the number of shooting days, the members of the cast and the number of scenes in which each actor appears, the casting director can ascertain the total number of days each actor will be needed and the number of days he will be idle, that is, when he will not be required for certain scenes.

Every casting director has his special classifications of

the thousands of players listed in Hollywood. His own studio roster consists of stars, feature and bit players, who form the studio stock company, similar to a theatrical stock company. A contract player or *star* is an actor or actress who has a term contract for six months. This contains options renewable up to seven years, a guaranteed salary for twenty out of twenty-six weeks, whether or not the player works, and a lay-off period of six weeks during which he must have at least one consecutive week's lay-off. A contract also provides for a rising salary scale. The studio has, besides its regular contract players, players who are known as *picture people*. These are stars, not under exclusive contract to the studio, who arrange to make a certain number of pictures for the studio, generally two a year.

Of the supporting players, who are considered important in bolstering up a picture, but are not box-office attractions themselves, there are the feature and bit players. Feature players are those contracted for a week at the minimum, while bit players are engaged by the day.

There are many thousands of free-lance players in Hollywood. These include any actor who receives over twenty-five dollars a day, which is the minimum salary for bit players. Many picture people free-lance after their commitments have been fulfilled. They often feel that they have more opportunity for good roles when they are not exclusively under contract to one studio.

The main classifications in the directory are stars and feature players: male and female. The casting director may include the same actress in several sub-classifications so that he will be sure not to overlook her. For example, he will list Janet Gaynor both as an ingénue and as a young leading woman, because of the distinction between the two

types and because she can qualify for both. Other classifications include character men and women, comedians and comediennes, colored people, orientals, musical and specialty talent. He may list a supporting player in four or five classifications such as a young leading man, a heavy, a character actor and a foreigner.

From his directory, the casting director makes his suggestions for the various players on an assignment sheet which he sends to the producer and director with his reasons. Then all three discuss them in conference. If the director is doubtful about any of his selections, he will test the actors himself. Otherwise the casting director arranges for the tests, which are called *production tests* because they are made for a particular picture. Perhaps the studio wishes to borrow an actor who has just completed a similar role at another studio. Then the picture in which he appeared is run off. If the studio decides to engage him, an arrangement with his studio is made. If he is a star, he is loaned at a fixed sum. If he is a feature player, he is guaranteed four weeks' salary plus what is called an accumulated carrying charge, fixed at three weeks' salary. This is to reimburse his studio for carrying the actor during his idle period, because when he is loaned to another studio it may interfere with his home studio commitments and considerable time may be lost before the schedule at his home studio can be rearranged. Lesser supporting players who are loaned for roles lasting less than two weeks are paid at the rate of two weeks' double salary.

With the cast finally established, the budget for salaries must be computed and checked by the production office. Its approval by the producer prepares the way for the final step in casting: drawing up the contracts. The casting director must be sure to engage players who have no other

Form No. C-34— 25 M

SCHEDULE #3

R K O Radio Pictures, Inc.

SHOOTING SCHEDULE

DATE Sept. 18, 1937

PICT. No. 998 TITLE HAPPY FELLOW DIRECTOR Leigh Jason

		ESTIMATED DATE	ESTIMATED DAYS	ACTUAL DATE	ACTUAL DAYS
	Start Rehearsal				
	Start Photography	9-8-37		9-9-37	
Holidays	Finish Photography	10-13-37	30	10-17-37	34

DAY	DATE	DESCRIPTION OF SET OR LOCATION	ACTOR'S NUMBER	Set No.	LOCATION OR STUDIO	DAY OR NITE
Mon.	9-20	Int. John's Apt. and Balcony	1-3-4-5-7-23	5	Stage #10	D
Tue.	9-21	Int. John's Apt. and Balcony	1-3-4-5-7-23	5	"	"
		Ext. Courtyard	1-3-4-5-6-23-X	5	"	"
Wed.	9-22	Int. Susan's Room	1-3-23	5	"	"
		Ext. Courtyard - Balcony and Miko's Door	1-3-8-23	5	"	"
		Int. Miko's Room	1-3-8	5	"	"
Thu.	9-23	Ext. Courtyard and Balcony	1-3-4-5-23	5	"	"
		Ext. Dermont's Shop and Alley	1-17-23-B-X	5	"	"
		Ext. Courtyard	1-3-8-17-23-B-X	5	"	"
Fri.	9-24	Int. John's Room	1-3-4-5-7-8-23-X	5	"	"
		Ext. Mama Didot's	1-3-8-X	5	"	N
		Int. Courtyard and Balcony	1-3-8-23-X	5	"	"
		Int. John's Room	1-3-7-8-25	5	"	"
Sat.	9-25	Int. Mama Didot's Cafe	1-3-8-9-12-13-14-23-B-X	8	Studio	"
SUNDAY						
Mon.	9-27	Int. Mama Didot's Cafe	1-3-8-9-12-13-14-23-B-X	8	"	"
Tue.	9-28	" " " "	1-3-8-9-12-13-14-23-B-X	8	"	"
Wed.	9-29	" " " "	1-3-8-9-23-B-X	8	"	"
		Ext. Mama Didot's Cafe	1-B-X	5	Stage #10	"
		Int. Susan's Limousine (Proc.)	1-12-13-14	2	Studio	D
Thu.	9-30	Ext. Entrance Fletcherville	1-12-13-14-15-16	1	Act. Loc.	"
		Ext. Fletcher Home and Grounds	1-12-13-14-15-16	3	Location	"
Fri.	10-1	Int. Private Chambers Children's Society	1-2-3-4-5-6-7-8-19-20-21-26-27-B	14	Studio	"
Sat.	10-2	Int. Private Chambers Children's Society	1-2-3-4-5-6-7-8-19-20-21-26-27-B	14	"	"
SUNDAY						
Mon.	10-4	Int. Private Chambers Children's Society	1-2-3-4-5-6-7-8-19-20-21-26-27-B	14	"	"
Tue.	10-5	Int. Fletcher Home, Lower Floor, Hall and Drawing Room	1-2-10-11-17-18-19-20-21	4	"	"
Wed.	10-6	Int. Fletcher Home, Lower Floor, Hall and Drawing Room	1-2-10-11-17-18-19-20-21	4	"	"
		Int. Fletcher Bathroom	2-10	4	"	"
		Int. Fletcher's Room	2-10	4	"	"
Thu.	10-7	Int. Fletcher's Drawing Room	1-2-4-5-7-8-10	4	"	"
Fri.	10-8	Int. Jail Fletcherville	1-3-4-5-7-8-28-X	20	"	N
Sat.	10-9	Int. Jail Fletcherville	1-3-4-5-7-8-28-X	20	"	D
		Int. Fletcher Kitchen	5	4	"	"
		Int. Manhattener Office	7-29	22	"	"
SUNDAY						

NAME OF CAST AND NUMBER

NUMBER	CHARACTER	NAME	DAYS WORK	DAYS IDLE	TOTAL DAYS	START	FINISH DATE
1	Susan Fletcher	Miriam Hopkins	33	1	34	9-9	10-17
2	Mr. Fletcher	Henry Stephenson	7	2	9	10-1	10-11
3	John O'Halloran	Ray Milland	27	7	34	9-9	10-17
4	Katie	Mary Anna Strelby	18	12	30	9-11	10-14
5	Joan	Betty Philson	18	13	31	9-10	10-14
6	Dermont O'Neal	Alex Craig	9	12	21	9-10	10-4
7	Karl	Walter Abel	11	9	20	9-17	10-9
8	Mike	Guinn Williams	17	6	23	9-22	10-17
9	Ma Didot		4	0	4	9-25	9-29
10	Judd Butler		3	0	3	10-5	10-7

Assignment sheet of the casting director, including the shooting schedule. Each actor is assigned a number at the bottom of the sheet. The column of numbers represents the actors appearing in each scene.

commitments at the time. If they have, shooting schedules must be so arranged that an actor's assignments do not conflict. The pre-shooting duties of the casting director are over.

When production begins, the assistant director each day notifies the casting department of the additional people required for the following day as extra talent for racial or atmospheric groups and bits. An extra is any actor not required to speak lines who receives $16.50 or less per day and is not under contract to the studio. A bit player is an actor required to speak lines who receives twenty-five dollars a day. If an extra is required to speak lines, he automatically becomes a bit player.

When the studio first needed extra talent, great throngs of people, lured by the promise of good wages, flocked to Hollywood. Many agencies sprang up to accommodate all these people, and there were always crowds in front of their offices waiting for jobs. If a studio needed extra talent, a casting director from one of the agencies would glance over the crowd and select the types he thought best. In return, the actors were obliged to pay the agency a percentage of their earnings. This system was both unfair and inefficient. And as the industry grew, it became necessary to have one reliable source of extra talent. So the studios took over the best of the agencies and jointly agreed to share expenses, charge no commissions and use it exclusively. On January 2, 1926, the Central Casting Corporation was founded by the Association of Motion Picture Producers. Since then, it has become the largest employment agency in the world, giving three hundred and fifty thousand jobs each year. Every day, over eleven thousand calls come in for work, half of them between eight and four each day, then every five minutes from

four to eight in the evening. The incoming calls average between seven and eight hundred an hour.

The studio casting directors send their orders for extra talent over three teletype machines to Central Casting. Here a bell rings, a light shows, and the order is automatically typed out. This lists the date, the time the extras must report, the name of the director, the number of the production, the type of make-up necessary and whether or not doubling is permitted, that is, whether an extra who has already worked in that production may be used again. Then the number of extras, their ages, costumes, salaries and any extra specifications required are listed.

For example, an order came in for two hundred and thirty-five extras to appear the next morning, rain or shine at nine o'clock, without make-up, with doubling permitted, for a Sunday picnic for the Truck Drivers' Union. All the characters were truck and van drivers and all extras were to wear their Sunday best small-town spring clothes, with no straw hats or anything white. Of those required, forty-six women and seventy-five men were to receive $5.50 a day, twenty-three women and seventy-five men $8.25, and fifteen men $11 a day.

All wage distinctions for extras depend on the appearance, physical type and wardrobe. The lowest wage, $5.50, is paid for nondescript mobs and atmospheric types. Better physical types and better-dressed extras are paid on a rising scale. Attendants, porters and the like receive $8.25. Extras who take the parts of policemen, waiters, detectives and more desirable physical types, such as bank directors and people in street clothes, are paid $11 a day. The highest-paid extras are dress extras who receive $16.50 a day and must provide and maintain their own wardrobes, which include complete evening, afternoon and sports outfits.

For a scene representing the exterior of a concert hall, a call came in for:

1 woman, 25-35 years, wear fall street clothes, hat and coat, bring along car, must be late model, $2.50 extra for car—$11.

2 men, 35-45 years, wear full dress with top coats, hats, canes and gloves—$16.50.

3 women 20-25 years, wear late-winter evening gowns and wraps, nice hair, dress and jewelry, nothing black, wear colors—$16.50.

All period costumes and uniforms are provided and fitted by the studios.

When the call sheets come in, they are given to one of the five assistant casting directors, who sits in front of a call board containing the names of a thousand extras not working that day. The name plate of each extra has a number of colored dots which indicate his or her wardrobe. As the calls of the extras seeking work come in, they are conveyed by a loudspeaker directly from the telephone switchboards to the specially constructed desks, so that the assistant casting director may have any call turned over to him. Then he fills in the names of those calling, or phones extras he particularly wants.

Registered files are kept of all extras according to sex, age, height, general appearance, listing all physical assets and peculiarities in detail, such as chinlessness or broken nose, size of feet, buck teeth, cauliflower ears and bony legs. All manner of detail is listed, from the way an extra wears clothes to previous occupation, practical experience, proficiency at sports, stunts, imitations, musical instruments and languages. The main classifications are dancers, cow-

boys, college boy and girl types, character parts and miscellaneous, which include all types from freckled-face babies to knife-throwers and contortionists.

A machine called the *mechanical casting director* can be used in any emergency to pick the required type. This goes through the complete file of extras selecting the desired qualifications by the numbers on their cards. But the mechanical casting director is rarely used because the assistants know the files so well that they can immediately call any extras to mind. The head casting director of Central Casting has an even more remarkable memory: he knows the names, addresses, wardrobes and qualifications of three thousand extras by heart.

If the director wants to select his own extras, *interview extras* are sent out to the studios. This means that the director is given an hour and a half in which to interview them. If he keeps them longer, they are paid on a quarter-check basis up to two hours, and every two hours thereafter. Those not chosen are paid carfare by the studios.

Of the twelve thousand five hundred extras registered only about 5 per cent of those registered get calls. Actually, there is work for only about five hundred of them. To join the ranks of the extras is the quickest way down. There is almost no hope of advancement and there is every chance of slipping. No other employment agency has had so many failures. Everything possible is done to discourage people from becoming extras. The lists are closed except for a request from the studios or when special types are needed, such as a hunchback or one-legged man.

Only a handful of stars have risen from the extra ranks and today this is extremely rare. Studios seek star material in more recognized channels. They are particularly anxious to develop their own players. In fact, every time a studio

signs a contract with a feature player, they hope for a new star. Feature players are given important assignments. If they do well, and the reaction at the box office is favorable, they become stars in their own right. But stardom is extremely unpredictable. Often players who have been dropped by one studio are engaged by another and become stars overnight, whereas other equally talented players may not become stars for years. This is always the result of a combination of circumstances in which temperament undoubtedly plays a part.

Outside of the studio, producers and directors are always searching for new stars. Talent scouts comb the little theaters, college dramatics, benefit performances, local radio stations, and night clubs throughout the country for potential screen idols. And with the renewed activity in road shows, they are increasingly covering the legitimate fields. Working from New York as a center, they communicate with the nearest office in New York or California. If the prospective talent cannot go to either to be tested, a newsreel cameraman makes preliminary tests which are then sent to Hollywood.

The material for a dramatic screen test varies with the individual. It may be a one-act playlet or it may have to be specially written. It should always give the prospective screen actress or actor as much variety as possible. Ordinarily, an actress who is accustomed to the stage waits for an audience reaction before continuing her lines. But in taking a screen test she has a total lack of response and the added confusion of perhaps ten technicians hovering around her. Under such circumstances she is apt to be under a disadvantage and to give a wooden performance. A method has been devised to overcome this. A preliminary scene of her is made in which she speaks a few impromptu lines.

These are planned while her make-up is being applied, so that she can be as spontaneous as possible. Often, in a preliminary close-up, she explains in a few words the basic idea of the play in which she has been appearing and the circumstances of the scene she is about to do. The test is shot as though it were a cut-out from a motion picture, with numerous angles of her and of the supporting players. In this way the producer is enabled to judge the actress both in and out of character, so that a scene from her play is not his sole criterion of her screen personality.

If a singer is tested, both photographic and recording tests are made. These are equally necessary because a trained pitched voice generally gives no indication of the screen candidate's personality. If she is a dancer, her best routine is photographed, as well as a short scene to give an indication of her speaking voice. Tests of specialty and acrobatic acts for screen musicals may have to be made on rather short notice between bookings. All tests made in New York are immediately sent to Hollywood to await further decisions.

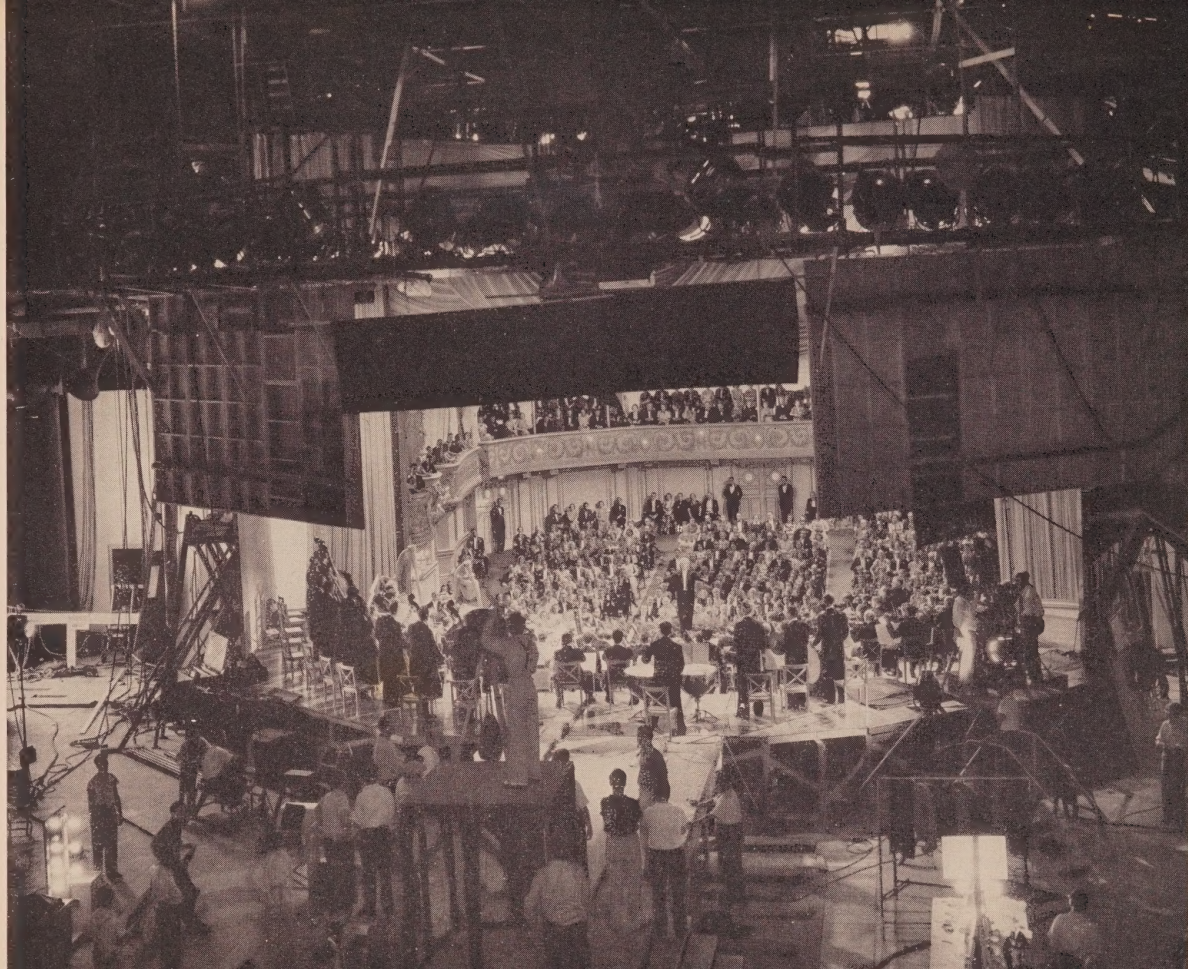
If the producer, director and casting director cannot decide upon an actress from the studio stock company for a particular part, production tests are made in New York of actresses on Broadway. If the studio likes one of the tests, they take an option on the actress. This may be for three months, six months or a year. She will then be called to Hollywood to play the particular part designated. But the studio will wait until after the preview, when the audience reaction will have been gauged. If she is well received, the studio will exercise her option.

If the studio considers a new player who has been discovered by a talent scout, but who has had little dramatic training, the casting director arranges and supervises an

audition for him. If the actor needs training, he may be coached at the studio or placed in a little theater. Then, when they feel he is ready, he will be given a stock test which includes both camera and dialogue. If the test proves successful, he will become a member of the studio stock company.

It is futile for ambitious boys and girls to come to Hollywood on the strength of good looks alone. Dramatic training is an essential factor in screen success today. Although there are no well-defined rules, dramatic coaching and voice culture are both valuable as a background for screen acting. It is far better for a prospective screen actor to spend several seasons in a stock company. The theatrical field is sufficiently well covered throughout the country so that, when a promising actor appears, he can always be tested. Thus the studio stock company grows and new names are added to the casting director's lists.

The players are cast. Let them speak for themselves.



Set showing dress extras in the concert hall in "One Hundred Men and a Girl." In the right foreground may be seen a make-up table. In the center foreground, a still man is photographing the scene. Various members of the crew stand in the foreground. Above the set are the many arc lights on the cat-walk used for general illumination. (Courtesy of Universal Pictures.)

IX

THE ACTRESS PLAYS HER PART

Bette Davis

AN INVITATION to present the motion-picture industry from the viewpoint of its actresses is a great honor—and a difficult assignment. Never for a moment think I am going to be able to do justice to the problems of all my famous confrères. It is impossible to generalize about the picture business, particularly our branch of it; I can only tell you what I have found out for myself. However, I do believe I have seen it in most of its moods—when it has completely ignored me, and when it has been more than generous in its belief in me. There is much to be learned from both of these attitudes and the variable temperatures in between.

If the studio weather department will hold back the artificial fog of glamour for a while, I want to show you what it's really like to be a star, and to convince you of two things: First, we are just plain workers here, and second, we are more anxious to do work for which you will commend us than we are credited with being. That ought to be obvious. You will continue to make us and break us as long as pictures are shown. In other words, we are your humble servants. Oh, yes, we are!

The most important consideration in a star's career is

choice of story. Without the proper vehicles very few of us would ever have arrived where we are. A kindly disposed critic may take the trouble to note a good performance in an otherwise inferior picture; but the average theatergoer is interested in entertainment, and the entertainment value of a screen play never rests with the star alone. Studios employ many talented people for the sole purpose of finding suitable material for their top players, and only in rare cases is the star permitted to make her own selection. Her opinion may be asked, but the final decision rests with the studio officials. Usually Joe Doaks on Main Street knows what her next assignment will be as soon as she does—it all depends on who reads the morning papers first.

I personally believe this is not as unfair as it seems, for I am of the opinion that actors and actresses are notoriously bad judges of story material. Principally interested in the part intended for us and the number of good meaty scenes there are for us to play, we are apt to lose sight completely of weak and insignificant plot construction or the development of the rest of the characters in the story. It would be extremely bad taste for me to name the stars who, in the past and in the present, have measurably damaged their careers by insisting on contracts which permitted them to choose their own stories.

Neither does it follow that the studios are always right. Often a studio has a script ready to go into production with an inferior and uninteresting leading role for either the actor or the actress, but the picture must be made immediately to meet a release date. Since players are put under contract in order to retain their exclusive services, they must be paid whether they are working or not; and

when they are not working they are a worrisome item of expense. If the studio has scheduled nothing suitable for the star at such a time, she may be requested to go into this production even though they know it is unjust, and there is nothing for her to do but play the part, knowing the public will think less of her for it—or refuse to do it, which usually results in suspension without salary for as long as it takes to make the picture in question. In short, she gets spanked either way.

When the public reads in the newspapers that a star has "walked out on" her studio, their natural reaction is to say, "Tsk! Tsk!—Temper—temper . . . !" Actually the reason for it is more likely to be her refusal to disappoint her audiences by letting them see her in a role wholly unsuited to her talents and below the standard that she has consistently fought to maintain.

The number of pictures a star makes annually is almost as important as the selection of her stories. It is easy for an audience to tire of an actress it sees too often—and it appears to get just as weary of her if it doesn't see her often enough. In my present contract there is no limit to the number of pictures I make in a year, but I believe that a contract limiting an actress to four is neither detrimental to her career nor unfair to her studio. If I were free-lancing, three would be my limit; first, because screen acting is such exhausting work that I think we need long vacations between pictures; and second, because it is almost impossible to find more than three stories in a year's time which are both well-suited to me and worth your money at the box office.

Nothing is more staggering to me than to be asked how I create a character. There just isn't any one answer to

that question. It depends entirely on what the assignment happens to be.

If I am to play the leading lady in a modern picture, my worries as an actress are concerned with wardrobe, hairdress, learning the script, and interpreting it to make the most of whatever opportunities it offers me. I make a practice of discussing all these things with the director as soon as possible, to make sure that our conceptions of the character are enough alike to avoid misunderstandings and costly waste of time on the set while the film is in production.

I should like to add, here, that I have never played a part which I did not feel was a person very different from myself. The character I am playing stays behind in my dressing-room at the end of the day and is waiting for me there the following morning. I do not intend this to sound as if I were "arty" about my work. On the contrary, I am extremely workman-like. Perhaps it is explained by the fact that I have never—except when I am actually working—been able to realize that I am known as an actress. You have no idea how grateful I am for this frame of mind in Hollywood, where it is not easy to keep a normal outlook on oneself as a person. While I am acting I am living in an imaginary world, bringing imaginary people to life, just as I used to "live" the fairy stories I read when I was a little girl. And I think it's the grandest game in the world. Whether or not I am always successful at it, I am constantly trying to make my audience know these "phantom" friends of mine as well as I do.

When the director and I have agreed on the appearance of the character, the head costume designer (Mr. Orry Kelly) and I confer for hours. He makes many

sketches which we discuss as to their suitability for both her and me, and when we have finally decided what she is going to wear, the pins, shears and needles start flying in the workroom.

Fitting and sewing costumes year in and year out, the skillful women in the workroom are faithful and loyal to their stars. Though they receive no credit for the final product, they are as interested as we are in seeing that gowns are perfect in every detail. Often they are more patient than we during the long hours we must stand for fittings. They know how the camera will emphasize the slightest wrinkle or bad line, and avoiding these defects is a matter of pride with them.

The completed gowns must be tested before the camera. This is very important, for even though our costume designers are trained to know what colors, materials and body lines are photographically "right," they sometimes make mistakes. A costume which is charming to the eye often proves most unattractive photographically, and must be replaced or changed. Preliminary tests of wardrobe may save the studio large sums of money which might otherwise have to be spent on retakes during production.

"Hair tests" are necessary for the same reason. If the camera doesn't happen to like our hairdress, it can do disastrous things to us. And unless the cameraman is accustomed to working with us, he usually wants to make photographic tests to discover our best "angles" and the most effective lighting for our features.

By the time all of these tests have been made and approved by the director and the production head, we are ready to start on the actual work of making the picture.

All of this, as I said, is the customary preparation for

a simple, modern leading role. If, however, I am assigned to portray a famous character from history or a well-known fictional character, or a person with an accent unfamiliar to me, the little duties really start piling up. Endless hours must be spent in reading about them, studying their lives and habits, until I feel I know them so well I couldn't possibly do anything inconsistent with their characterization. Imagine how much of such preparation Paul Muni must have spent on Pasteur and Zola. I also collect pictures of these people at all stages of their lives if they are historical, so as to be able to resemble them as closely as possible physically. Make-up must be minutely tested to get the nearest facial similarity we can, and the costumes of the period must be studied thoroughly to avoid anachronisms and errors in detail.

For a fictional character such as Mildred in *Of Human Bondage,* the novel is used as a textbook—read and reread until I am thoroughly acquainted with her every thought. Scattered descriptions are carefully checked for indications of dress and mannerism. With Mildred I had the added problem of the cockney accent—a frightening one for an American actress. My solution of it was to invite an Englishwoman with a knowledge of cockney to live at my house with me. For six weeks before the picture began we spoke nothing but cockney, with the result that the accent became so natural to me that a great part of the time during the shooting of *Of Human Bondage* I did not even realize I was using it. I sometimes think that people who see us on the screen demand much less of us in this respect than we do of ourselves. But I have a passion for authenticity.

Every actor has a different method of memorizing lines.

Though I spend a great deal of time on the script before the picture starts, absorbing the story as a whole and developing my characterization, I seldom actually learn my lines until the night before the shooting of each scene. Then they are fresh in my mind for the day's work. But, if I have a difficult scene with many long speeches, I start learning it weeks ahead, as I find I am usually too tired at the end of the day to memorize a scene of this kind thoroughly in one evening.

When the shooting begins, the studio does everything in its power to help the star concentrate on her performance. She has her own hairdresser, her own wardrobe woman to see that her clothes are at all times pressed and clean, and a make-up man to watch for any flaws in her make-up. And she has her own dressing-room on the set, where she may study or rest during the long waits which are part of the daily routine.

Once we start working on a production, that is *all* we are able to do until it is finished. After hours, an actress who is conscientious about her work is too tired mentally and physically to think of anything but a nice, long, beautiful rest. Fortunately or unfortunately, I am one of those. If the material in the picture is worthless, one has to work twice as hard to make something of it; but I have a sincere desire always to be able to say when the picture is finished that I have done the very best I could with the part.

You smiled when I said we get dog-tired. The surest way I know to convince you of this is to show you just how we work, by describing an average *shooting day*.

I get the gentle but compelling touch on the shoulder between six and six-thirty in the morning—depending on

how far I am living from the studio and how elaborate my make-up is for the picture I am doing. After I have arrived at the studio, it takes at least two hours to have my hair dressed and dried and my make-up applied. There is usually just time to get to the set by nine o'clock and put on my costume. I am then ready to rehearse for the first scene of the day.

The amount of rehearsing we do is entirely dependent on the director. Some directors believe that lots of it insures a better performance when the cameras start grinding. I agree with them. As far as I'm concerned, there can never be too much rehearsal, for during this time the cast learns to work together and often discovers bits of business that give the screen play naturalness and smoothness. The director of a "B" picture, with a small budget and a two or three weeks' shooting schedule, obviously cannot spend much time trying scenes out, and the picture usually suffers from imperfect performances. But on an "A" picture, with an ample budget and six to eight weeks' shooting time, it is possible to have plenty of rehearsal and still conform to schedule.

When we have finished rehearsing, the cameraman is given free reign to light the set. Stand-ins, resembling the actors in height, weight and general coloring, go through the action to be shot, while the cameraman arranges the lights. This gives the cast a chance to cool off, refresh their make-up, see that all the curls are where they belong, and to discuss the scene with the director if necessary. Then one final rehearsal for the actors, the camera and the sound department—and the scene is ready to be taken.

If a scene is shot only once, the incident is recorded as a major miracle. More commonly it has to be repeated

Bette Davis makes sure her hair is in place for her next scene. (Courtesy of Warner Brothers Pictures.)

Edmund Goulding, the director in white, rehearses Bette Davis and Ian Hunter in a scene from "That Certain Woman," while first cameraman Ernst Haller, leaning on the camera, watches their camera angle. (Courtesy of Warner Brothers Pictures.)

Bette Davis plays a scene with Lola Lane and Mayo Methot from "Marked Woman" directed by Lloyd Bacon. (Courtesy of Warner Brothers Pictures.)

from three to as many as fifteen times. Before a take is O.K.'d it has to be right for the director as far as performances are concerned, for the cameraman, and for the sound department. The last is a particularly exacting master. The sound man must hear every word distinctly, unimpaired by outside noises such as airplane motors, passing trucks, coughs, footfalls, or any of a million and one other incidental sounds. All of the things which may spoil the take for any of the departments are utterly unpredictable. Since the members of the crew know how difficult it is to keep a scene alive beyond the third take, they do everything in their power to keep things going smoothly. You never saw such a display of mass patience and precaution! Often, of course, the actors themselves are responsible for spoiling the shot. We just can't get that "something" the director is looking for—and we *have* been known to muff lines. The success of a day on the set is determined by the degree of co-operation between director, crew and players. No one of us can work alone. We need each other.

An hour for lunch, then back to freshen make-up and hairdress and begin again. The day is usually over at six, after which most of us spend half an hour in a projection room seeing the rushes of the previous day's shooting. Now we go to our dressing-rooms, remove make-up, put on street clothes—and go home, arriving there between seven and eight o'clock, slightly the worse for a working day of from twelve to fourteen hours.

But that is not the end of it. Dinner, then off to a quiet corner with the script, to batten down enough dialogue to carry us through tomorrow. For us, ten-thirty is bedtime; there's very little a make-up man can do with circles under our eyes.

A day's work, and work it is—every minute of it. I don't think you can name any other profession that requires so many actual working hours spent in producing something to be seen and judged by millions of people the world over. It is largely our awareness of responsibility to all those people that makes the actual shooting of a picture so nerve-racking. Every take must be approached as if it were the one which you will see in your theater. Everything we've got must go into everything we do.

Fortunately, inside most of us is the love to create, and we are more than willing to devote the best years of our lives to it. Hollywood pays us well, but the applause we receive from our audiences stimulates us to go on and do finer things. We want you to let us know you like us. Call it childlike if you will; but since our profession is dedicated to bringing you moments of pleasure, the measure of our success is your response to what we do. You, the audience, are literally the fuel that keeps the fire going. Never for a minute think we are bored by your praise. It is what we live for.

Another problem peculiar to the life of a motion-picture star is publicity. It is a tremendous consumer of time apart from our other studio duties, and because it plays such a vital part in the development of a star's career it necessitates a great deal of understanding.

Thousands of men and women are employed by the studios and by the stars themselves to take care of publicity. Their job is to discover the type of exploitation best suited to one's personality, then use it as frequently and as tastefully as possible. These are the people who give you your ideas as to what we are like apart from

our roles, and it is to our advantage to co-operate with them.

Everywhere we go, it seems, someone is waiting to take a shot of us with a still camera. We pose for portraits, for fashion pictures, sports photos of every description, and for those so-called "intimate" shots in our homes.

Personally, I have never believed in the sort of exploitation you see in commercial advertising, although early in my career—due to circumstances beyond my control—my name was used in connection with certain products. Nor do I like publicity pictures taken in bathing suits or semi-undress. I consider both of these forms of publicity disrespectful to the public's taste. And I get rabid and foamy over what we call *gag* or *stunt* pictures. I refuse to believe that they fool anybody. If an actress who doesn't know a putter from a pogo-stick has her picture taken swinging a golf club, the rankest amateur of the sport has every right to a good laugh at her expense.

It is quite possible that I am worrying about something that is not particularly important, but I feel the same way about acting. If I am playing a scene in which I am supposed to be soaking wet, I believe in looking wet even if the general effect is perfectly horrible. Or if I am beaten up by a gang, as I was in *Marked Woman*, I don't want to come out of it looking as if I had just been released from a convent. Audiences are too smart for that sort of thing, and it makes me a little ashamed to try to fool them. It all goes back, I suppose, to those puritan ancestors of mine—they left me with a frightening conscience.

Aside from the time it takes to pose for stills, we spend many hours with members of the press, both on and off the set. Many of them come from all over the world to meet us. There are also a large number of writers for fan

magazines who want to know our ideas on millions of subjects. Though I can't imagine why my ideas on any of these matters should be worth anything to anybody else, I must admit that by the time the clever writers have their stories ready to print, the words they put into my mouth impress even me. They are more than generous in their descriptions of us. For all this we are truly grateful, but I will never cease to feel inadequate with them during interviews. I am always wishing there were some great, dark, hidden thing in my life for me to tell them so that they would go away thinking, "What a fascinating life Bette has had!" But my life for the last ten years has been mainly hard work.

One of the greatest dangers of publicity is its tendency to be forced. Excessive amounts of unwarranted publicity are far more dangerous than none at all. I am often reminded of a remark made to me by George Arliss very early in my career. It is far more important, he said, for young people starting in pictures to worry about the actual value of their work in front of the camera than to rely on undeserved exploitation. There are countless sorry examples in Hollywood of newcomers overpublicized before they ever appear before the cameras. It would be impossible for them to live up to the public's expectation of them based on their advance notices. Almost invariably they die an early professional death, really through no fault of their own. I sincerely believe that all young players breaking into Hollywood should carefully guard themselves against such exploitation.

On the other hand, a well-established player, to whom publicity comes naturally, should not scorn any interest shown by the press, for this is just as essential to the length

of her life in pictures as the actual work she does in front of the camera.

Success in any profession is an interesting subject for speculation. I don't believe that it is ever completely unwarranted. There must be reasons for it. Success in my profession is, of course, the most difficult to understand. One minute an actress may be down and out and unwanted. Then something happens, and in the next minute—figuratively speaking—the whole course of her life may be changed and she may find herself the idol of millions.

There is much talk in Hollywood about the well-known "lucky break," but that is seldom a satisfactory explanation. The successful actress has probably spent years of her life working and hoping. She has had sufficient courage and self-confidence to stick to the profession she loves in spite of what looked like insurmountable obstacles. She has earned at last the right to be an important person in her field. No one in this world *ever* gets anything for nothing. Luck helps a lot in getting to the top, but it won't keep you there for long. Any actress who credits the fickle lady for her entire career is being either very modest or very apologetic about her accomplishments.

It's hard work becoming a first-rater in the picture business, but once we've arrived the going seems to be subtly rougher. We are open to criticism and jealousy from friend and foe alike, and we must constantly struggle to maintain whatever standards of excellence we have set for ourselves.

In our contracts there is an amusing clause stating that the producer considers our services "of a unique and extraordinary nature." Flattering, but still no key to the secret of success in Hollywood.

Hard work does it, health, and the determination to let nothing stop you.

If you are ambitious to be a leader in the acting profession, make your belief in your talents strong enough to brook any discouragement that may come to you, work every inch of the way—and the chances are that some day you may become a new star in the theatrical firmament. See if you won't!

X

THE ACTOR PLAYS HIS PART

Paul Muni

TO ACT in motion pictures is to act in a world in which mechanical problems beset the actor on all sides: his performance is governed by them, he cannot escape them. From the time he appears on the set, his steps are caged by chalk marks and focal distances, his voice is directed by microphones, controlled by dials, and his image can only be seen if he moves with care within the cage.

To speak of a motion-picture performance is to speak of thousands of images on one strip of film, cemented together. The actor does not himself select these images or juxtapose them. His work in the pattern of the picture may be completely changed through the assembling of these images, over which he has no control. His performance is recorded, stored and placed in neatly labeled tins, then perhaps deleted. Finally, it is unrolled, projected, seen through a lens and heard through a horn before an audience hundreds of miles away from himself.

Perhaps if I describe the various processes for an actor in making a motion picture, you will see how his work is only part of the complicated pattern of production.

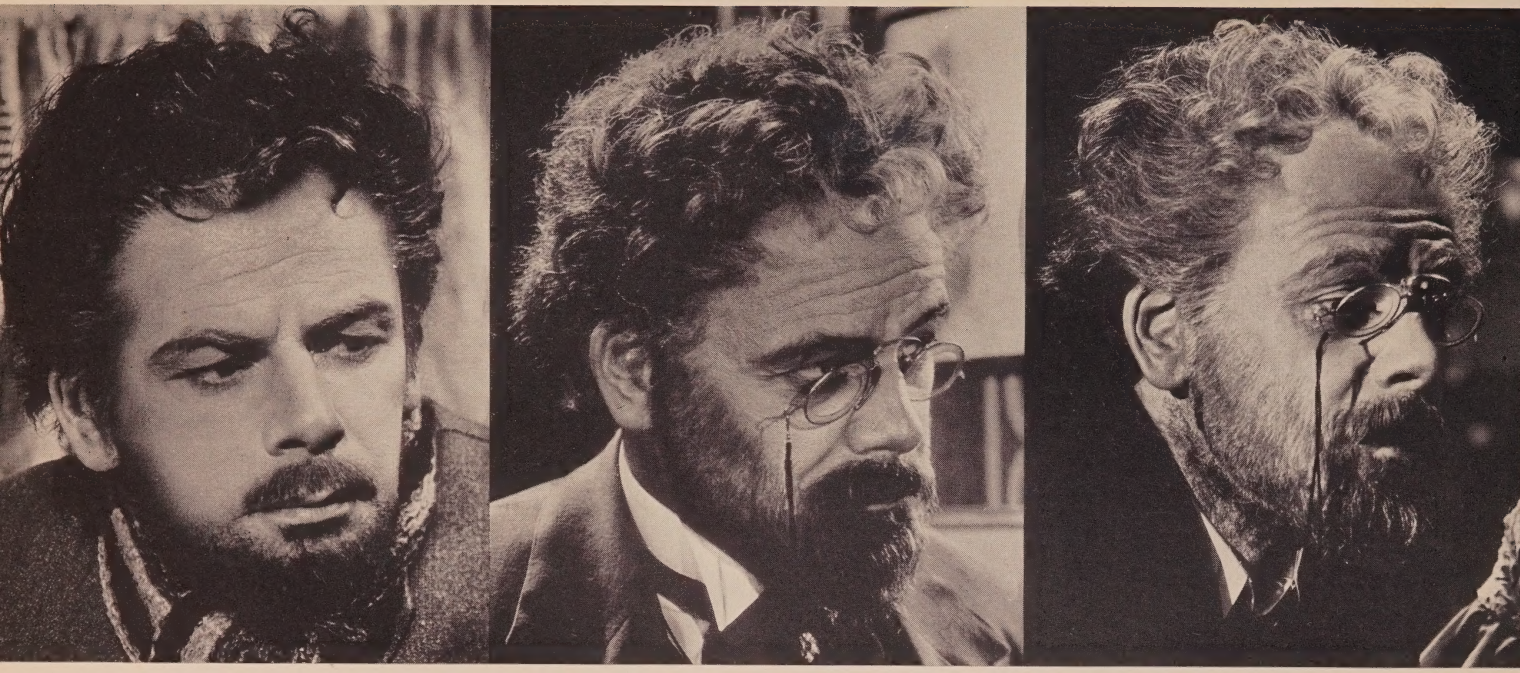
We begin with the script. Some actors have no choice in the selection of their scripts. Others are fortunate

enough to be able to choose their own stories and to work with the writer from the beginning, watching the story develop and helping to mold the characters they will play on the screen. I have been fortunate in this respect. My arrangement with the studio gives me a choice of four stories at a time, which the studio submits to me three months before production. I select two of these for my year's work, or two from a second group, if none of the first are satisfactory. The choice is made from a script which may vary from a ten-page synopsis to an elaborate treatment including dialogue, character analysis and suggestions for camera angles. If a synopsis is submitted, the studio supervisor usually discusses it with me so that we may nail down the writer at the earliest stage in his work, and tell him hopefully what we want when he is called in to conference. Then, taking into consideration all possible difference of opinion, we discuss the script as thoroughly as we can.

The story goes back to the writer for an incubation period of six or eight weeks. Ten weeks are not considered too long, if the job is a special film. When the writer is at work, the production supervisor confers with him frequently to bring his script closer to what we think it should be. At the end of this period, the first rough draft appears. This reaches me, and I take it home, go through it, talk it over with my wife, and expose it to every critical spotlight I can find. Again the producer, writer and I confer. This time we reach a final decision on the script.

Now the director comes into the conference. He brings a fresh viewpoint, a strong visual sense, practical experience and camera training. His ideas are likely to be among the most valuable contributions.

Two weeks more go by, while the writer is working



Paul Muni in three stages of make-up as Emile Zola from "The Life of Emile Zola," directed by William Dieterle. (Courtesy of Warner Brothers Pictures.)

The cameraman focuses, and the "gaffer" or electrician adjusts the lights before Paul Muni plays a courtroom scene from "The Life of Emile Zola." (*Courtesy of Warner Brothers Pictures.*)

on the changed draft, now in its second stage. During this time the director is assembling his cast and technical crew, and making final preparations before shooting.

Meanwhile, I am studying the character I am to play from his background, type and manner of speaking and acting. First, there is the physical appearance to establish. If my story is biographical, I try to get photographs or paintings of the character. Then I read as much of the background material as is available: books which explain his life and times to me, and those materials which give me his mental world. For *Zola*, there was everything: photographs, his books, what his contemporaries wrote about him and the photostats of the court records in the Dreyfus case.

In *The Good Earth*, the character of Wang Lung presented a different problem. Here was no historical character, but a type, a man who represented a whole race. I tried to associate some sort of composite man with the Wang Lung I was about to play. Quite frankly, I never felt that my mental picture of him was realized by my execution on the screen.

It is not important to be the historical replica of a character. It is important to make him real to your audience. I have never felt responsible for preciseness of gesture. In fact, I think that an actor should not try for this. He should conceive the part clearly, collaborate with the writer, and bring the character to life in all its meaning. A biographer invents incidents, if necessary, to bring out hidden traits which explain a character more fully. The actor cannot invent incidents. But by concentration, voice and gesture, he re-creates a man.

Before the character is set on his feet, make-up tests must sometimes be made. The head of the make-up de-

partment knows what physical details are required from his copy of the script. I then describe to him the character as I see him. During the preparation of *Zola*, I described Emile Zola in his youth for the opening sequences as a young, naïve crusading writer, living the life of a bohemian in the Latin Quarter, and expressing that life in his face and body. At this point, the research department aided me with photographs.

When the make-up department and I agree on points of likeness, we begin the tests. In *Zola* there were five age-transitions to be made. We started with the last and most difficult step, the old Zola of the Dreyfus period, with his high intellectual forehead, his gray beard, his heavy cheeks, because that make-up would take the longest to work out. For each age transition, the artist of the make-up department paints or draws over the actor's photograph the additional facial characteristics necessary for him to resemble the character. Using this method, one may see at a glance just what changes must be made on the actor's face. It was necessary to heighten my forehead with make-up, to lift the hairline and make it seem my natural one. This took six hours to effect, at first, but the time was gradually reduced to an hour and a half, as we became more accustomed to it.

Then, still photographs are taken of the make-up. Our mistakes can be seen in views of the back, side and front of the head. We go over the make-up until we have corrected the slightest error. Then, when we feel we are ready, motion-picture tests are made under the harshest lights (no gauzes may be used for diffusion here), and before the sharpest lenses. The motion-picture camera will pick up flaws which the eye will miss altogether. It can also see all sides of the actor's make-up in motion, which

are not apparent from the stills. Again, we correct our mistakes until the make-up is good under every possible lighting condition.

Costumes must now be planned and fitted by the wardrobe department. Costume plates have been given to the head designer by the research department, from which the designer has made sketches. In a historical production, male actors are provided with costumes. In a modern picture, they supply their own clothes.

In my preparation for acting a part, I would like to write a set of rules by which the technical mastery of acting may be accomplished. But I have not found any such rules. If I knew any which held, I should be glad to follow them. Even if an actor has acquired a set of elementals in dramatic training, it is not enough for him to use them for the entire framework of his acting, and to penetrate no further. He is far from an accomplished actor after he has received these fundamental theories and become expert in them. He may be apt, with a pleasing voice, a natural gift for oratory, a quick mind and a graceful figure. Perhaps he has acquired all the theoretical foundations of acting. Perhaps he has put these into practice and found them profitable. Yet, without a great emotional capacity and a great heart, and without being the perennial student which any creative person must be, he cannot reach the depths of any role, because he only uses the fundamentals he has learned. He may think he is a finished actor, but he is really only an expert trickster.

For me, acting is a constant study. Each new role brings problems which I must solve empirically. Others may be privileged to meet them in acting schools or under the guidance of coaches. But I have had to work them out in experience, each time I play a part, or indeed each time

I play a scene. There is no textbook, no school of acting I can recommend. I believe that an actor can really place himself in a part, relying on instinct and experience to guide him, without depending on academic formulas.

However, in learning dialogue I do have a pattern which is the reverse of what I have said about the feeling for a part. This method has been most helpful to me. I have found it best to parrot my lines, to memorize them directly, so that I can speak them without analysis or thought for their meaning. Often I will read a speech over and over, at home, until the phrases come to me automatically and rhythmically.

While parroting my lines, some of the thought behind them is bound to penetrate subconsciously, so that my interpretation is partially set, but not so rigidly that I cannot change it. Once the lines come to me automatically, I discard them completely and think of the thoughts they express. Often I substitute other words until I am confident that the lines are mine and that I need no longer think of them.

Sometimes I change the shadings of the words because they have assumed a new significance. Now they begin to live. During this process I often note, in the margin of the script, associations and parallel feelings which have come to me while I was learning my lines. For example, in Zola's speech to the jury, which lasted six and a half minutes, I wrote a page of notes, which completely changed my original emphasis. When I first repeated the speech to myself, I spoke it loudly and emphatically. Then, I thought of the meaning of the words, "Men of France, I know you, I know the life you have led." The more vital the speech became to me and the more strongly I began to feel it, the more quietly I now felt it should

be spoken. Thus my associations helped me to determine the cadences of my lines.

When I reach a scene which has never even remotely touched my life, I use the associative method or substitution, thinking of situations which may have nothing in common with the one I am to play, but which, for me, will evoke the mood and feeling of my scene. Gradually it becomes clear to me. The words no longer matter; it is the thought which predominates. Concentration on meaning will make an actor change lines sometimes, but it will keep fresh in him the underlying motives of the scene.

When situations arise of which I am patently ignorant, I take them to people whose judgment I can trust: I confer with the director, get his suggestions and criticisms; I go over them with my wife, who works with me constantly, both at home and while shooting.

I like to do my preparatory work at home with a recording machine, so that I can play back my lines and listen to them critically for changes. I do not record until I have reread my part at least a hundred times. This gives me the effect of my thought, enunciation and intonation. The recording machine helps me to polish these, but the only medium for creating a part is the mind. Working this way I do one or two sequences, sometimes less, a day.

After all the preparations are completed, the first day of shooting arrives. The director goes to work and we learn his methods. When the actors first come on the set, they read through their lines once or twice and become accustomed to each other's method of acting. This first rehearsal generally takes place without lights. After about half an hour or an hour, the actors leave the set, going either to their dressing-rooms to rest and study their lines, or to smoke. An interval of an hour or an hour and a

half passes while the cameras and lights are adjusted, and all rehearsals are at a standstill. Then, when the actors return, they read their lines perhaps once or twice again, and the director calls for a take. The scene is shot from many angles, to include enough variety for the final editing of the picture. This takes more time; there are long waits.

On the stage, you have a strong sense of security. You are sure of your four weeks' rehearsals, with the entire cast, from the beginning to the end of the play. You can work gradually into the part, knowing the timing and the rhythm, letting the process become subconscious, and later you may color and change and add to the characterization. But in acting for the screen you do not have the same sense of security. Your sets change, your scenes are juggled according to available floor space, not according to the continuity of the script, and once a satisfactory take is made, the scene is finished. There is no possibility now of molding character through the infinite repetition of one scene.

The uncertainty continues. Often a script is revised during shooting, and must be learned from day to day. Sometimes the writing is so close behind the shooting that your lines are chalked for you on a blackboard out of range of the cameras, to be read as the scenes are shot. Or you may be slated to do an exterior scene on Monday, and on Monday the sun is not out.

Since the scenes are rarely taken in the order of the script, the actor must make the additional effort of mentally co-ordinating his lines before the camera. He must be ready to reorient to the state of the scene preceding the one now being shot, and absorb its effect so that his work will show the proper emotional development. On

the stage, he can build mentally scene by scene, and in a logical series. But a screen actor must do without any of this. In *Zola* I started work one day on a scene in which I was to shut the door on a crowd behind me and face my wife. According to the script, this scene followed one in which I had been chased through the streets by an angry mob and had reached home and safety just in time, completely exhausted. Since the mob scene had been shot at an earlier date, I had to imagine the state of mind of a man pursued. In reality I was alone on the set. I had to imagine the mob from which I was escaping.

In working with other actors, I must visualize in the same way I do when creating a part for myself. For acting is mainly reacting—to someone else. And you can only react if you mentally re-create a person who has qualities to which you are sympathetic. For example, if you are called upon to play a scene with an actor whom you must hate in a scene, and whom you really like, you must visualize the kind of person you really hate, so that your reaction will be true. It is this response of an actor which an audience senses, and which it feels is either true or false.

The extent of response of audiences depends on the degree to which they identify themselves with the character the actor is projecting. If the identification is complete, so that his joys and sufferings become theirs, then only can his acting reach them; then only can it be truly successful.

It has been said over and over again that actors are exhibitionists, that by acting they are merely demonstrating feats of temperament, but I think that a good actor is actually a creator, and that the character he creates through his physical self is another person, totally unrelated to his own personality. Personally, I prefer parts that are unlike

myself, and not those exhibitionistic parts that are given to many Hollywood stars, who act as themselves on the screen.

Because of the star system, it is easy for an actor to fall into a series of identical parts, and these are identical because the actor does not create another person, but only exhibits himself. There are few who have not fallen into this worst of actors' habits. But the system is not snatched out of thin air. It developed because the average movie fan goes to admire the stars, not to see them act. The strongest compulsion in the motion-picture industry has been the glorification of the stars, and the elaborate work of the publicity departments has been centered on such an appeal. Most audiences are interested in the direct projection of a glamorous personality rather than in the creation of a role through that personality. The industry for years has kept actors who cannot act, not out of charity, but because they have wide public appeal. Here the emphasis rests on a standard of physical beauty and charm which is the ideal of millions of people, and emanates from Hollywood.

If the public likes an actor in a certain type of part, the producer and the actor himself may be afraid to break the pattern, because audiences might not like it. Few actors have the desire or opportunity to take this decisive step. When they do, as Robert Montgomery did when he played the role of a psychopathic killer in *Night Must Fall*, after years of playboy parts, the step is recognized as a courageous one. And his example must be followed by other stars.

For my part, I refuse to play duplicate roles. I have frequently turned down good parts because they were too close to work I had already done. A creative actor must

master as many kinds of parts as he can find, to increase his range and to prevent being typed.

The recent emphasis on biographical stories has opened a new field for the actor. Within the limits of history, the actor has much opportunity to interpret the character. His life has set its mark on history, his actions have been recorded. We are sure of his humanity, because he has lived. A character in the mind of an author sometimes keeps its remoteness; it may never come to life. The interpretation of a fictitious character may change tremendously between the hands of its actor and author, and an entirely different conception may result. A biographical role, on the other hand, is a complete person.

In the characters I have played on the screen, I have tried, without being didactic, to say something interesting to audiences, something significant about our times. Both Louis Pasteur and Emile Zola appealed directly and forcefully to their audiences. Each was potent in his time; Pasteur effectively opposed the bigotry of medicine as it was practiced in his century, and broadened the field of experimental science. Zola spent his life championing the oppressed through his writing; he persevered in a tireless search for the truth. Both of these men were willing to risk themselves for their work; they needed, above all, to function in society.

I believe the application of such lives is clear. I hope that what I have said will point to this belief of mine: that whatever knowledge of behavior, of technique, or processes we may have, we must go beyond in motion pictures. We must be able to give artistic and emotional assistance to audiences. Pictures must devote themselves to more than story or personality. They must present themes which will reach the audience. The actor who can pre-

sent these themes through himself will make a vital and identifying contact with his audience. By re-creating the lives of characters which have been potent social forces in their own time, perhaps the actor can reach people and influence them so that they will go forth with a new strength and a new vision in combating the evils of our own society.

XI

SHOOTING THE MOVIES

John Arnold, A.S.C.

THE REAL goal of all the manifold activities which compose a production is to secure perhaps one hundred and fifty thousand tiny photographs on a few miles of celluloid ribbon.

It is quite true that a motion picture originates in a series of mental pictures in the minds of producer, writers, director, and so on. But it is equally true that these purely mental images cannot go out and entertain audiences or win enough of the public's quarters and half-dollars to ring up a profit on the company's cash register. To do this, those mental pictures must be translated into visible, tangible form.

That, in a nutshell, is what makes the cinematographer's work more truthfully a calling than a job. The cinematographer, of course, is the man responsible for getting those one hundred and fifty thousand little snapshots on those two miles of celluloid. In the old days, he used to answer to the name of cameraman; of late, he is more and more frequently called the director of photography. No matter what you call him, he has a uniquely intricate job.

First of all, there is the matter of making mechanically good pictures of the physical settings and action before his lens. In spite of the intricate complications introduced by

the high technical standards of modern photography and by the pictorial technique of telling stories, technical proficiency is perhaps the easiest of the cinematographer's tasks.

You see, there are those troublesome mental images to contend with. Also, unless they are conveyed to the audience, your production is going to be just about as dramatic as the stereograph pictures of the World's Fair which Aunt Nellie used to keep on the whatnot. The cinematographer must bring to the screen not only the concrete action and appearance of the scene, but also its dramatic and emotional mood.

Psychologists have said and written much of the way the cinema makes its audiences vicarious participants in the emotional reactions of its characters. In general, they have pointed out, this effect of participation is far more noticeable on the screen than on the stage: in one case, the spectator is looking *at* a scene; in the other, he feels himself taking part *in* it. While some of this must unquestionably be attributed to the artistry of writers, directors and players, and to the intimacy of the close-up camera, it cannot by any means be laid wholly to these causes.

The principal cause, I believe, is the fact that the camera can and does transmit the mental imagery of these artists to the audience. If the import of a scene is cheerful, the camera can make the spectator feel cheerful even before an actor appears or a word is spoken. If the mood of the scene is sad, tragic or melodramatic, the camera can evoke these responses as well. It is entirely possible to make two takes of the same action and dialogue, played against the same setting by the same players, and by skill-

ful camerawork make the two takes have two very different dramatic meanings.

Consider a very simple scene: a bedroom in which a sick child lies, while its mother keeps constant vigil. If this scene is presented in somber tones with long, menacing shadows on the screen, you feel at once that the child is gravely ill, and may never recover. If, on the other hand, the room is in lighter tones, with sunlight streaming through the windows and a cheerful sparkle evident everywhere, instinct tells you the crisis has passed, and the child is on the road to recovery.

The instrument used to evoke these responses is light. It is the cinematographer's most important tool. Not only does light make his picture in the literal sense, but it can make or mar the appearance of sets and players, and create any desired emotional response in the audience.

To understand why and how light works for the cinematographer, let's go back for a minute to the very elementary principles of photography and cinematography.

First of all, we see things because they reflect light to our eyes. If we turn off the light, the object is still there —but we can no longer see it. If the light falls on only one part of the object, we will see light reflecting the illuminated part, and not the part that is not illuminated and reflects no light to us.

Long ago it was found that certain compounds of silver —especially silver bromide and silver chloride—are sensitive to light. If exposed to light, they change from their normal cream color to a dark gray or black, according to the amount of light reaching them. What actually happens is that the silver salt is changed to black metallic silver. There are several chemicals, known as developing agents, which have the property of accelerating this action,

so that after an exposure so short that no darkening action is visible to the eye, the affected silver salts can be darkened by the developing agent as effectively as though a long exposure had been given.

If the light falling on such a sensitive surface is focused through a lens which forms an image of a scene or object, that image will be reproduced as a pattern of variously darkened silver: where the most light fell, the silver will be darkened most; where less light fell, the silver will be less affected; and where none fell, there will be no darkening whatever. Obviously, not all of the light-sensitive silver would be used up in this case, and if we immediately took our developed picture out into the light it would fade as the previously unexposed silver darkened. So we treat the picture with chemicals which dissolve out the undeveloped silver salts, but have no action on the developed metallic silver.

This gives us a negative, in which black is white and white is black. If we repeat the process, making the exposing light pass through this negative, the situation will naturally be reversed and our developed picture will be a positive, showing white as white and black as black.

Photographers have been doing this with still pictures for considerably over a century, steadily improving the details of the process as time marched on. The ideal has always been a photographic picture which could accurately reproduce not only form but movement.

Men have known how to re-create movement even longer than they've known how to draw pictures with light and lenses. The ancient Egyptians knew that if you drew a picture of a moving object at any one point in its movement, another at a point slightly more advanced, and so on, and viewed these images in quick succession, they

would blend together and give an illusion that the pictured object moved.

But how to do this with photography has been a puzzle. The early photographers coated their light-sensitive emulsions on bulky metal plates, and later on equally bulky, fragile plates of glass. Neither would do for making motion pictures, where the innumerable movement-arresting individual pictures had to be made and changed at incredibly short intervals—not less than sixteen pictures every second, and preferably more.

In 1888, however, came the epoch-making invention of photographic film—light, flexible celluloid coated with the necessary light-sensitive emulsion. From then on, the invention of successful moving pictures was assured. Actually, so many workers reached the goal in quick succession that even today we can't be absolutely certain who was the first, though it is generally conceded that Edison in America and Lumière in France produced the first movies almost simultaneously.

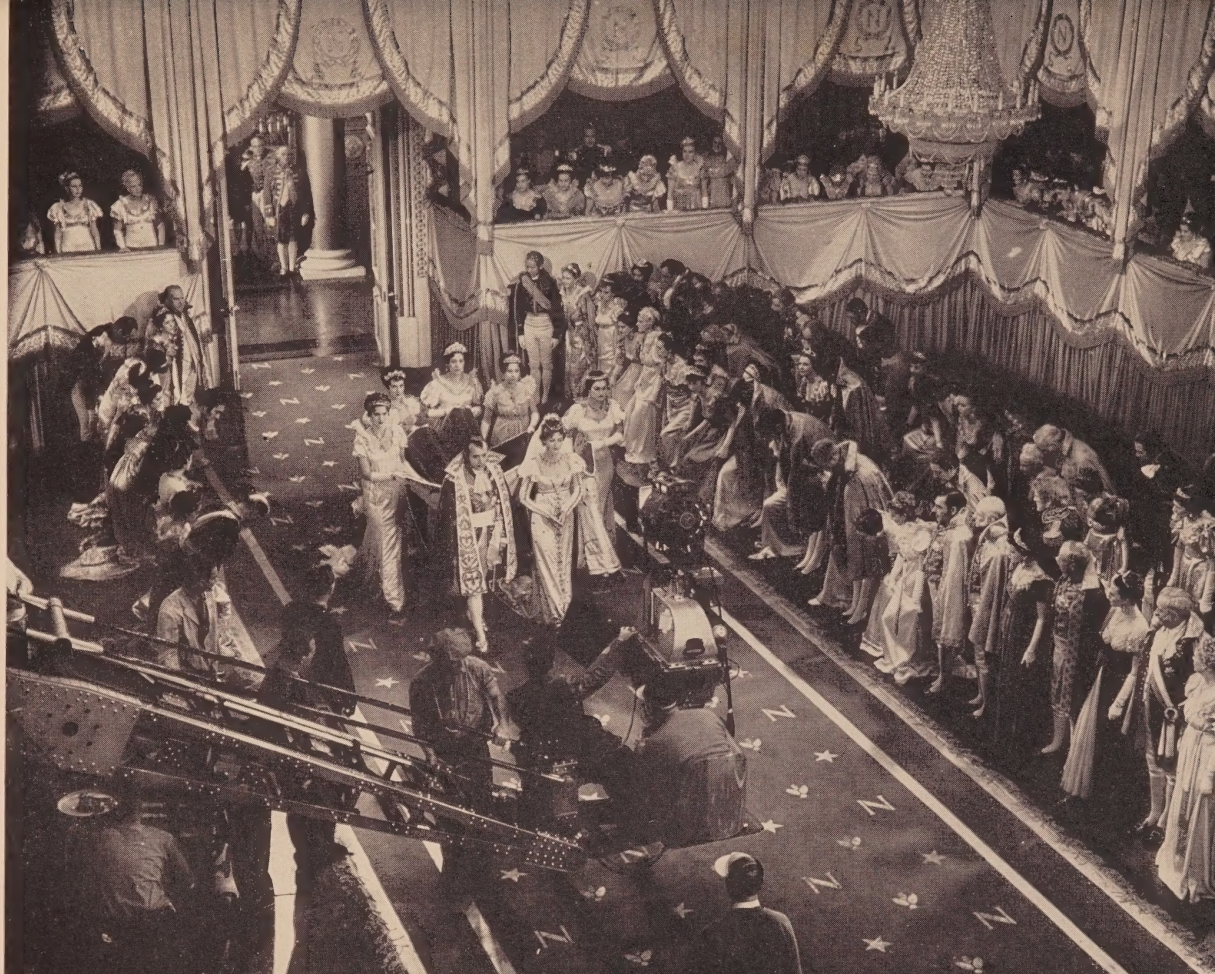
And here the long arm of coincidence gave the newborn movie a powerful boost on its path to becoming a world-wide institution: working independently of each other, Edison and Lumière adopted virtually the same physical dimensions for their film and pictures. And as these two individuals established firms which for many years dominated motion-picture production and distribution, their fortuitously similar standards became accepted as the world's standard dimensions for motion-picture film and equipment. Due to this standardization, today a professional motion picture made anywhere in the world can be run on professional projection equipment in any other land as perfectly as though it were made there.

These dimensions call for a film 35 millimeters, or 1.378

inches wide.* Along each edge of the film is a row of little rectangular holes or perforations, by means of which the film is moved through camera and projector. These perforations, which are spaced .187 of an inch apart, must be extremely accurate, for upon the accuracy of the perforations depends the steadiness of the picture on the theater's screen. Each tiny picture or *frame* measures .868 of an inch wide by .631 of an inch high—or approximately the size of an ordinary postage-stamp! When this picture is projected to fill a forty-foot screen such as is common in our larger theaters, the picture—every minutest detail of it—is magnified more than 581 diameters; a detail of the image which on the film is only five one-thousandths of an inch in size—too small to be seen without a microscope—will be nearly three inches high on the screen!

There are sixteen of these tiny frames on each foot of film. If you are one of those mathematically-inclined people who cannot read figures like this without whipping out a pencil and figuring things out, you will already have noticed that these dimensions, even allowing for a generous margin outside each row of perforations, seem to leave a lot of the film's area which is not usefully accounted for. Well, on the left-hand side of the film, between the perforations and the frame, is a strip .084 of an inch wide called the sound track, on which sound is recorded. But even allowing for the sound-track area, which pretty well accounts for all our usable space laterally, we still seem to have only about ten inches of picture on twelve inches of film. This might be called the cinema's sacrifice on the altar of art. Before sound came to requisition that tenth-of-an-inch strip along our film, the picture-area or frame

* There are three smaller-sized standards for amateur and home-movie film: 16 mm. wide, 8 mm. and in Europe, 9.5 mm. wide.



The camera mounted on a small crane follows the actors in a scene from "Conquest." Attached to the camera is a small spotlight which highlights the principals. (Courtesy of Metro-Goldwyn-Mayer Pictures.)

filled all the space between the perforations save for a marginal spacing of about 1/32 of an inch on each side and between frames. This gave a picture-proportion of 3 x 4, which is aesthetically the most pleasing proportion possible for all-around use. The sound track arbitrarily cropped this down to a square, which is disturbing if you have to concentrate long upon it. Accordingly, the present reduced-aperture frame became standardized, to restore the more pleasing format. That this desirable proportion was originally chosen seems another fortunate coincidence, for the early inventors were too busy trying to solve mechanical problems to give any thought to the artistic future of their invention.

From the time when celluloid film first made movies possible, down to the present day, the history of cinematography has been closely bound up with detail advances in film. Emulsions have steadily grown *faster*—more and more sensitive to light, so that not only is less light needed to make an exposure, but increasingly delicate gradations in lighting may be photographed.

The early films were *color-blind*—sensitive only to blue and ultra-violet light; steadily film has become sensitive to more and more of the spectrum. About ten years ago panchromatic film which, as its name implies, is sensitive to all colors, was introduced, and revolutionized cinematography. Today's super-panchromatic films see colors in very much the same relative strengths as our eyes, while yet rendering them in terms of black and white. And one new film, sensitive to the invisible infra-red, permits us to make convincing night-effect scenes in the daytime and to secure clear photographs of distant landscapes hidden in haze.

Lenses have advanced apace, growing more and more

accurate in their delineation of scenes, and faster, or capable of letting in more and yet more light. A high-grade modern lens will actually reveal more detail in a picture than would be perceived by the human eye looking at the same scene.

Cameras have evolved no less remarkably. The early ones made pictures, but that was about all you could say for them. To take just one example, they did not move the film very accurately; and if the film does not come to rest in identically the same relative position as each frame is photographed, the picture on the screen will jiggle. Today, cameras are instruments of such high precision that not only is this unsteadiness wholly a thing of the past, but for trick shots the same film may be run through the camera a score of times without varying a thousandth part of an inch in the registration of any frame during any of the twenty exposures. Laymen are often amazed when I tell them a modern studio camera costs anywhere from five to fifteen thousand dollars; in reality, the amazing thing is that an instrument of such incredible precision can cost so little.

From the start, the cameraman has used light to make his picture. How he uses it has changed fully as much as anything else. In the early days, illumination was all that was required, whether it was supplied by the sun or by artificial sources. Today, mere illumination is secondary to *lighting*—painting the picture with light-beams to create an illusion of depth and roundness in a picture which is really flat and seen on a flat screen. To accomplish this, lighting equipment has changed from crude floodlighting units, which simply threw out a flood of illumination, to precision-lighting tools which project a beam which can

be controlled in spread, intensity and quality with great precision.

Almost the sole survivor of the early-day floodlighting units is the *broadside*, commonly called the *broad*. It is a relatively simple lamp which houses two 1,000-watt globes side by side in a box-shaped reflector which spreads their light out in an even flood over an angle of approximately 60°.

The broad has been supplemented and in some cases replaced by the *rifle*, which uses one 1,000- or 1,500-watt globe in a deep, bowl-shaped chromium-plated reflector. This reflector has a spiral corrugation much like the rifling of a gun-barrel; hence the name of the unit.

The really fundamental lighting tool, however, is the *spotlight*, which instead of casting a flood of light projects a round beam whose spread may be varied from a very narrow spot—say a spread of 8°—to a wider and consequently less intense beam of as much as 45° divergence. There are two basic types of *spots:* the older lens-spots, which form their beam by means of a lens, and reflecting spots, which produce the beam by using a parabolic mirror. Most recently of all, a new type spotlight which somewhat combines these features, using a bull's-eye *lighthouse-type* lens in combination with a small spherical mirror to produce a smoother and more accurately controlled beam than either of the older types, has been introduced. These latter lamps are called *solar spots*, and nicknamed *Juniors* and *Seniors* according to whether they take a 2,000-watt or a 5,000-watt globe. The older spotlights have a wide variety of names and nicknames: the reflecting spots are generally called, according to the size of their mirrors, *eighteens, twenty-fours* and *thirty-sixes;* they use, respectively, 2,000-watt, 5,000-watt and 10,000-watt

globes. The two latter, incidentally, are sometimes called *5 K-W* and *10 K-W* lamps since their wattage is respectively five and ten kilowatts. The lens-type spotlights range from *baby spots* of 500 watts up to 1,000 and 2,000-watt units. These have a great variety of nicknames, including *bon-bons.*

There are a number of special-purpose lamps, among which may be mentioned the *Lupe,* which is a long, funnel-shaped lamp holding a 1,000-watt tubular globe, and mounted on a peculiar, double-jointed standard which permits it to be used in almost any position; the *sky pan* is simply a flat, bowl-shaped reflector used for throwing a flood of light on painted sky backings or backdrops; and the various obsolescent *banks* and *strips* which are simply big floodlights holding four, six or more globes.

For natural-color cinematography these standard incandescent lamps are duplicated in modern, noiseless arc-lighting units which produce light virtually identical with the color of natural daylight. In the arcs, the lens-type spotlights are called *rotaries,* because one of the carbons rotates; the mirror-spotlights bear the familiar name *sun-arcs;* and the newer bull's-eye lensed spots, since they are high-intensity arcs, are called *Hi-arcs.*

There are many accessories used for controlling the light from these various lamps. For instance, there are the different diffusing screens used to soften the rays from any one lamp: these may be made of silk, gelatin, oiled cellulose, celloglass, frosted glass or lenticular glass strips; they are called *silks, jellies, oils, cellos, frosts, Florentines,* and so on. Other devices are used to screen the rays of lamps from the camera; flat or adjustable screens are called *niggers* and *gobos;* conical hoods that concentrate the rays are often called *snouts;* similar ones with adjustable, flat

flaps are called *barn-doors*. These various slang terms for the various lighting units save a lot of time and confusion on the set, but to the uninitiated they seem strange, as they did to an alarmed stage star some years ago hearing a cameraman who wanted his electricians to turn out a broadside and to turn an Ashcraft spotlight on the lady, say, "Kill the broad, hit her with the ash-can and tie 'er off!"

Similarly, too, the cameraman has learned how to control natural light when working out-of-doors. *Reflectors*, big squares of plywood covered with tin, aluminum or gold paint, throw illumination into shadows; artificial lights often serve the purpose of reflectors (and much more efficiently), and are called *booster* lights; canopies of muslin or netting, called *scrims*, are stretched over the players' heads to soften or eliminate direct sunlight. Even on the African veldt, the modern cinematographer can control light as precisely as he does on the studio stage.

Outdoors, too, another important accessory is often used. This is the color filter. It is simply a little piece of colored glass or gelatin which is placed over the lens or, in the latter case, directly in front of the film. Its purpose is to make the film see things as the cinematographer wants them seen. I have mentioned that modern films see colors in *almost* the same relative brightnesses our eyes do; filtering properly done can change that "almost" to "exactly." Filters can also exaggerate—*overcorrect* is the technical term—any desired color. Of course the result is still a black and white picture: but the desired color may be rendered lighter or darker as may be needed. This matter of filtering is too involved to discuss at length, but in general, if you use a filter of the same color as the one you want to change, you lighten that color; if you want to

darken that color, you use a filter of a complementary color. For example, in viewing a landscape we are aided by the color contrast which makes the white clouds stand out pleasingly against the blue sky; in a picture, the sky might ordinarily be rendered too light a gray to give contrast to the clouds: so we use a yellow, orange or red filter which darkens the sky to whatever degree we may desire—even to turning it a midnight black for a night-effect shot.

Still another vital cinematographic tool is the diffusing screen. As has been mentioned, modern lenses can reproduce objects with such microscopically accurate detail that our picture will reveal things which the eye would not see in reality, and which we may not wish to have so brutally revealed. Therefore the cinematographer almost always fits a device over his lens to break up the image-forming light-rays very slightly. This produces a more naturally soft picture. Many types of diffusers are used, according to the need of the scene: nets of fine gauze, screens of imperceptibly "frosted" gelatin, and glass discs with a spiderwork tracery of fine lines or concentric circles. Many scenes are filmed with so little diffusion that they appear as though none at all was used; some require so much that the picture on the screen is obviously "fuzzy."

But how does the cinematographer put all of these details to practical use? Let's trace the cinematographer's part in making a modern production, and see for ourselves.

In the beginning, the producer and the studio's executive director of photography must choose a cinematographer to direct the photography of their picture. This involves quite as many considerations as casting, choosing a director, or any of the other major production problems. We always try to begin by selecting a cinematographer

whose artistic style and technical talents are most perfectly suited to the type of story we are filming. Most really good cinematographers are versatile—but what's the use of assigning a man specially skillful in making women glamorous to film an outdoor epic with a rough-and-ready male star? Or why take a man whose forte is realistic or melodramatic camera treatment and assign him to a romantic comedy?

Naturally, cameraman and director must work in close co-operation, combining their respective personalities. Dissimilarity of temperament is desirable. A nervous cinematographer paired with a director equally nervous, affects the set very like spontaneous combustion. A deliberate, slow cinematographer and a slow-paced director may produce beautiful pictures, but no business office would approve the combination. Hare and tortoise in conjunction insure success. Best of all is the combination of a cinematographer and director who have previously worked together and established a mutual professional respect and personal friendship. From the pioneer days of director D. W. Griffith and cinematographer Billy Bitzer down to the present, there have been many such director-cameraman teams, and they have produced most of our best pictures. The camera half of one such partnership recently turned down half a dozen more lucrative foreign offers and made the six-thousand-mile trip from London to Hollywood just to be on hand when his director co-partner started a picture. The result won the lion's share of that year's Academy awards.

Every bit as important is the relationship between cinematographer and star. In photographing any of our film stars, the cinematographer has two tasks. First, of course, he must make her appear as lovely as possible. Then, he

must show her personality as well. All this requires not merely photographic and artistic skill, but a subtle understanding of that star and her reactions. One cinematographer may score a tremendous success in photographing a certain personality while another, equally well equipped, may fail completely. One of our greatest stage stars, after a series of disappointing pictures elsewhere, came to our studio. When her picture was completed, she told me, "I can't thank you enough for assigning so-and-so to photograph me. Every other cinematographer constantly warns me against showing unfavorable angles to the camera. But this chap simply said, 'You tend to your acting. I'll photograph the picture and keep you looking swell no matter what you do!' He gave me such confidence that I turned in my best performance to date." Yet this cinematographer has had his failures with other players, while the cameramen this star condemned have succeeded brilliantly with them. No wonder many of our greatest box-office beauties insist on being filmed only by certain cinematographers. In some instances, stars have this provision as part of their contracts—and I've known them to fight more strenuously over this than over such factors as script, leading men or directors!

But let's say we've selected a cinematographer whose bent suits the story, whose methods suit the director, whose talents suit the star, and whose salary suits our budget. The next and always pressing question is, is he available? Or rather, will he be available when our picture is ready to roll? While there are always more cinematographers than jobs, there are all too few great cinematographers such as we would want for a picture of the caliber of *The Good Earth* or *Pasteur*. As a result, major studios always try to keep a group of the leading directors of photog-

raphy under long-term contract. Even so, it is sometimes necessary to rearrange schedules or assignments, or even to "borrow" an ace cinematographer from another studio.

However, let's say we have successfully negotiated this hurdle. Our director of photography has been selected and signed. Now he must have his crew. The crew usually consists of an operative cinematographer, one or two assistant cameramen, a still man, and the gaffer. Almost always they will be men who work regularly together.

The director of photography is really what the name implies. He rarely touches the camera other than to view his set-up on the ground-glass focusing screen. His real work is to direct the photography of the scene—leaving the mechanics of camera-operation to the crew.

The operative cinematographer is the man who actually runs the camera. He is the cinematographer's right-hand man. He it is who, in intricate moving-camera shots, sits with his eye glued to the finder, his hands swinging the camera to follow the moving action. He is responsible for the mechanical perfection of the scenes.

The assistants have a much more important job than their titles might indicate. They take care of the equipment: they bring the camera to the stage, load and unload it, check it frequently to be sure it is operating perfectly, measure the distance from lens to the main point of interest in each scene and set the focus accordingly, operate the *follow-focus* control in moving-camera shots, which is an electrical device for changing the focus when the camera moves toward an object, make out camera and laboratory reports and tend to a score of other important details.

The still man is the still photographer whose business it is to make the hundreds of still photographs a modern production requires for theater lobby display, magazine and

newspaper publicity, and for reference and research in half-a-dozen studio departments.

The gaffer is the chief electrician. While he is not, properly speaking, a member of the camera department, he is actually the cinematographer's chief of staff in the matter of lighting. A good gaffer, who has worked sufficiently with a cinematographer to become familiar with his methods, can be an invaluable aid to the director of photography. While the company is finishing on one set, for instance, he can *rough in* the lighting on the next, so that when the cinematographer is ready to shoot that set he need spend but a minimum of time adjusting the lights to gain the exact effect he wants. The gaffer's assistant, by the way, answers to the amusing title of *best boy!*

Exactly when the director of photography enters into active participation in the preparation of a picture varies enormously according to individual circumstances. Sometimes he may be tied up on another production until almost the last minute; at other times, he may be able to take an early and active part in making preparations for shooting. In the former case, much of his preliminary work must necessarily be performed by the studio's executive director of photography or by such of the studio's contract cinematographers as may be available.

Before any production starts, there are days and weeks of tests and conferences: tests of actors and prospective actors; tests of make-up and costumes for those finally cast; conferences with art directors and costumers to insure that sets and costumes are right both in themselves and for the camera, and that they will also make a satisfactory combination when jointly photographed. There are conferences with the director and writers over the photographic presentation of dramatic points. The cinematographer's advice

is vital in determining which points can be successfully conveyed: whether a sequence can be filmed more easily, effectively or economically by using one or another of the cinematic short-cuts an experienced cinematographer has salted away in his memory, or whether some other action can be filmed at all.

Then there are often atmospheric scenes to be shot before the production itself is started. The cinematographer or his deputies must often travel halfway around the globe to get these shots with which to make the production authentic. Within the space of a relatively few months, cinematographers from my studio have gone on such assignments to Europe, Africa, South America, the South Seas, China, Indo-China and Alaska, as well as most parts of America.

Locations for outdoor scenes which cannot be filmed on the studio lot must be selected. Here, too, the cinematographer's active aid is vital. Often he and the art director or unit manager will drive or fly great distances scouting locations. Sometimes they bring back reports of several possible locations, making the decision in conferences with the director. At times they—or even sometimes the cinematographer alone—make the final choice independently.

When the production itself is under way, the cinematographer's duty is primarily that of directing the photographic phases of the production. In collaboration with the director, he will have planned the most effective camera positions and camera angles for filming the scene in hand. While his assistants place the camera in the desired position, he attends to the lighting of the scene, directing the electricians to turn on this lamp, to swing that one about so, to concentrate this beam a bit more, to flood out that one, and so on until setting and players are perfectly lit.

The fact that a movie is a picture in motion rather than a static composition gives rise to very considerable problems in lighting. A player may be lit very satisfactorily in one position: but let him move slightly away from that position—taking a single step, or even turning his head—and the lights, which a moment ago made him look handsome, may not reach him, or may even cast strong highlights or shadows which accentuate undesirable features.

The action must therefore be rehearsed for the camera with the players' positions carefully charted, so that in the actual take they will know where to stand, where to stop, and so on.

No hard-and-fast rules can be laid down to govern lighting, for each scene makes its individual demands. Each cinematographer, moreover, has his own methods, just as a Rembrandt, a Greuze, or a Picasso has his individualized technique.

There are, however, certain fundamental principles which apply universally.

The tone or key of the lighting must be closely attuned to the dramatic mood of the scene. In lighting a tragedy, for instance, we would as a rule strive for somber effects, with heavy, foreboding shadows and soft contrasts to match the mood of the action. In a melodrama, we would preserve the low-key lighting, but modify it to give harsh, strong contrasts. For what might be termed normal, everyday action, we would give the lighting a normal, visual key and normal contrasts. For lighter comedy, we would raise the lighting to a higher key, not only to match the brighter action, but to make certain no comic antic passes unseen.

These basic treatments are subject to constant interplay within a picture, just as the different sections of an orchestra—strings, woodwinds, brasses and percussion—blend

and intermingle to produce constantly changing effects of colorful orchestration. Each sequence, and each scene within the sequence, of the picture has its own requirements, and must be lit accordingly, yet each must maintain a fundamental harmony with the visual mood of the production.

The matter of camera angles is equally important. By camera angles I do not necessarily refer to the odd and "arty" angles some photographers use to make their work appear "modern." These have their place in the cinema, but only a minor place.

Cinematically speaking, camera angles refer most simply to the various angles that form the basic cinematic vocabulary: the *long shot*, or *establishing shot;* the *medium shot*, which is a closer approach to the subject; the *two-shot*, which is the closest angle you can get of two people while still keeping both in the picture; the close-up and the extreme or big-head close-up. Each of these has, of course, many nameless variations.

But beyond this elementary application, camera angles have a much more significant, though less obvious, meaning. The camera, after all, represents the eye of the audience. And by placing the camera in the proper position, we can determine not only what the audience shall see, but how they will see it and react to it.

Let's suppose we have a character who is oppressed. In real life we would, psychologically speaking, look down at him from our own security. In a picture, we can let the camera look down on him ever so slightly from above—and the audience, though not conscious of the downward angle, will take the desired mental attitude. On the other hand, suppose our character is in the ascendant, rising above obstacles. In real life we would look up to him mentally; in

fact, we would even phrase our admiration that way. In the studio, we can let the camera actually look slightly up to him—and thereby gain the right psychological effect.

Again, the mechanics of lens-action enters this problem. The lens most commonly used in motion-picture photography has a focal length of two inches (50 mm.). A lens of longer focal length covers a narrower angle, and will give a larger image from the same camera viewpoint. A lens of shorter focal length will cover a wider angle, and will give a smaller image from the same viewpoint, but will include a larger area in the picture. Each lens gives a different perspective; and as the focal length decreases, the depth of focus—that is, the width of the zone of sharp focus in front of and behind the point on which the lens is focused—increases.

Now in making a close-up, for example, this gives us several choices. We can use our standard 50 mm. lens and move the camera closer to our player. We can use a lens of longer focus, and keep the camera where it was for the long shot. Or we can move the camera much closer still, and use a short-focus wide-angle lens for our close-up. Each will give us a particular effect. Using the standard lens, the background will be discernible, though not in critically perfect focus. Using a lens of greater focal length, the reduced depth of focus will give us a sharp picture of our player against a very neutral background. Using a short-focus lens, the background will be much more prominently focused in the picture. Thus for a normal effect we would use a normal lens for the close-up. For a close-up in which we wanted attention centered solely on the player, we might use a lens of longer focus. For a close-up in which we still wanted the background to play a prominent part, we would use a wide-angle lens.

There are many other subtle tricks of aiding audience-reactions with the camera. None of them are obvious. They can't be. They must fit so perfectly into the dramatic meaning of the scene that the audience is unconscious of them. Camerawork that calls attention to itself is bad camerawork.

Another matter which takes much of the cinematographer's attention (not always pleasantly) is the use and misuse of the moving-camera technique. Properly used, this technique is a commendable and powerful piece of cinematic expression. Improperly used, it is both a nightmare and a thoroughly wasteful luxury, for such shots are never easy to make and most unnecessarily-made ones are eliminated or broken down by wise cutters.

When you sit in a theater and watch a scene in which the camera glides effortlessly across a set or up a flight of stairs, following an actor's movements, you may think the making of such a shot is simple. In reality, it is anything but that. There are so many variable factors to be co-ordinated: movements of the actors and of the camera, speed, timing, lighting, and so on. Any one of these, even slightly out of co-ordination with the others, can ruin the whole take. Merely moving the camera is a problem. When we made silent films our cameras, loaded and on their tripods, weighed perhaps fifty pounds. Today the camera carries over twice as much film, is driven by an electric motor, and housed in a large and heavy soundproof *blimp;* the whole thing may weigh two or three hundred pounds. Moving this much dead weight freely about the set is in itself a mechanical problem of considerable magnitude. Doing it smoothly and noiselessly makes the task even more difficult.

Special devices have been developed for this work. They

are generically termed *perambulators*, *booms* and *dollies*. Of course there are many different types, but fundamentally all of them consist of a rubber-tired truck upon which a crane is mounted carrying the camera and its operators. The device may be rolled along the floor on its wheels, and the crane-arm may be raised and lowered and sometimes revolved, while the camera itself may also be panned (swung around horizontally) and tilted (turned up or down) on its *tilt-head* mounting at the end of the crane arm. The perambulators most frequently used allow the camera to be used at any height from within a few inches of the stage floor up to seven or eight feet in the air. In the most recent designs, this hoist is operated by electricity, and so convenient is this easily controlled camera-carriage, that even for non-moving shots perambulators have almost completely supplanted tripods.

The larger cranes known as booms are huge devices as big as a large motor truck, and lift the camera twenty or even thirty feet into the air, and permit it to make those swooping shots you've probably wondered at.

Strangely enough, the motive power for manipulating most of these camera-moving devices is human brawn. With the exception of the power-driven hoist on some of the perambulators and one big crane—the largest in the world—which is completely power-driven, all of these devices are moved, turned, raised and lowered by man power. This is not as difficult as it seems, for the crane-arms are carefully counterweighted. It is possible to raise with one hand a twenty-five-foot boom carrying at its extremity over half a ton of cameras and cameramen! In actual practice, man power is much more satisfactory, for with a practiced stage crew, the camera movement is much

more precisely controlled, and experienced man power, unlike a machine, can adapt itself to the unexpected.

Shots in which the camera moves around the set are generally called *dolly shots*. Where the camera is used on the big boom and swoops around the set on it, the term is *boom shot*. If the camera moves straight into or out of the set, sweeping quickly from a long shot to a close shot of some player, we have a *zoom shot*. Where the camera on its dolly travels along with someone walking or riding through the scene, so that on the screen we have the impression of traveling right with the player, we call the result a *follow shot*, or sometimes a *running shot*.

Lighting a big moving-camera shot is always an intricate problem. Ordinary lights are made to be satisfactory from one viewpoint—that of the camera—and moving ever so slightly from that position may change a good lighting into a bad one. When the camera moves constantly about the set, the lighting must be such that from every viewpoint, during every inch of that motion, the camera sees things only as they should be seen. As a result, it takes far longer to light and rehearse a perambulator, dolly or boom shot than an ordinary non-moving one. It is increasingly common practice now, in making such shots, to have many of the lamps connected to individual dimming devices so that light-beams which may be needed at some point in the shot, but which may not be needed or may even be undesirable at other points, may be imperceptibly turned on and off as they are needed.

But the really important thing in photographing a modern movie is to concentrate on the players. A discussion such as this should properly devote a great deal of attention to this aspect; but it is so completely a part of individual cinematographic technique that it is scarcely possible. One

might, perhaps, describe how a certain cinematographer lights a certain star: but the same man would undoubtedly use different technique in filming another star, while another cinematographer, in photographing the same star, would use entirely different methods.

In general, it may be said that a cinematographer uses highlights and shadows to paint the form and features of the players in their most attractive aspects. Properly placed highlights will accentuate almost any feature; properly placed shadows can do wonders in concealment.

Women, in general, benefit by softer, more delicate lighting than men. Again, some stars—especially feminine ones—require highly individual lighting in order to accentuate their screen personalities. One celebrated glamour queen requires a very flat, soft lighting combined with camera angles that give an illusion of increased height. Another is best shown with a strong downward-pointed light always striking her face, to accentuate high cheek-bones and to make the lower part of her face appear less square. Many women players with blue eyes, which might otherwise photograph too light, are lit always with a small spotlight fitted with a magenta-colored gelatin screen which makes the eyes seem darker and more sparkling.

The problem which arises when two or more players, each requiring a special type of lighting, are in the same scene together may well be imagined. The next time you go to a movie, notice how skillfully the cinematographer has blended his personal lightings: how, for instance, when a feminine star and her leading man appear in the same scene, the woman is lit more softly than the man. Yet unless you make a deliberate effort to notice such details, you are unconscious of the differences in the lighting of each player, save perhaps you feel subconsciously that she

looks very feminine and alluring while he looks very virile and masculine.

The make-up worn by the players supplements the cinematographer's work. Make-up serves much the same purpose as does the retouching of a portrait: it smooths out wrinkles and other minor blemishes, and gives the skin a smooth and pleasing texture at all times. It also gives the skin the right tonal contrast with the player's hair. For instance, imagine two women with virtually identical skin and features, but one a blonde and the other a brunette: the brunette would wear a relatively light shade of make-up to contrast with her dark hair, while the blonde would wear make-up at least a full shade darker to offset her light hair. Shadowed make-up, too, that is, putting artificial shadows and highlights where they are needed, can often help to simplify the cinematographer's facial lightings.

The cinematographer, as you can well imagine, spends a very full day at the studio. If his unit is moving into a new set, he often arrives well in advance of the company so that he may have the lighting of the new set well under way when the players arrive ready for work. Throughout the day he works constantly. When the final take of a scene receives the director's O.K., and the set-up is to be changed for the next shot, the director and players usually enjoy a bit of a breathing-spell. But the cinematographer's real work begins, for he must see that his cameras are placed for the next shot and the set lit. Then he calls the stand-ins of the principal players and gets the personal lighting roughed in. With this accomplished, he recalls the principals and perfects his lighting. As the director rehearses the action, the cinematographer, instead of being able to sit back in the security of a job well done, must be ever on

the alert to see that no change of action may require a change in lighting; that not the slightest flaw remains in any phase of his set-up. While the scene is being taken, he still watches for these details. Rarely indeed is a take made which the cinematographer cannot improve by some minute detail before the next take is made. It may be a major matter like removing with a trace of powder an unwanted highlight from the ingénue's nose; or it may be some minor detail only a cinematographer would notice, such as a beam of light illuminating a bowl of flowers in the background, which to his critical eye might be more perfect if the light were a trifle more concentrated, or the beam moved a fraction of an inch to one side. And when at last the take is pronounced O.K. for action, dialogue and sound, the whole performance must be done over again to make the next scene.

This goes on all day. And whether, as in a major studio production, the day's work consists of but three or four superbly finished scenes or, as in an independent producer's *quickie*, it involves from fifty to sixty hurriedly-made scenes, the cinematographer is constantly straining every energy of body and mind to make each scene as perfect as facilities and time allow. It is a tribute to our cinematographers that a scene N.G.'d or retaken for photographic shortcomings is as rare as the newspaperman's ultimate rarity, man bites dog. Recently when such an occurrence took place in our studio, the director involved solemnly placed a strip of the offending film on the camera department's bulletin board—not to ridicule the camera crew responsible, but, as he said, to give the boys a chance to see something they rarely have an opportunity to witness!

The number of takes made of each scene varies accord-

ing to individual circumstances. Sometimes every element may click perfectly on the first take; at other times, the scene may be taken and retaken a dozen or more times before everyone is satisfied with the result. Perhaps a safe average would be a matter of four or five takes. It is equally difficult to say how many feet of film will be used for the average scene, since many simple scenes will require but forty or fifty feet of film (sometimes less) while others, especially important dramatic speeches or intricate boom shots, will consume as much as nine hundred feet of film at each take.

What actually appears in the script as a single scene is almost always broken up into a number of different angles on the same action—long shots, close-ups, and so on. Generally speaking, many directors will cover every imaginable angle on a given bit of action, reasoning that it is best to get everything the cutter can possibly use while set and players are together, rather than getting too little and having to reassemble everything to fill in the gaps later. Often many of these protection shots may not be used or needed, but when one counts them against the cost of reassembling a troupe for retakes, they cannot be considered extravagant.

In between all of his strenuous work on the set, the cinematographer manages to view the rushes of yesterday's work; to consult with the laboratory that develops the film; to inspect sets and costumes for future days' work; to consult with the director and his aides on the best scenes to schedule for tomorrow's shooting. In his spare moments at home and in the studio, the cinematographer in almost every case is conducting some program of private study or research to prepare himself for the methods and problems of the future. And by way of a hobby, practically every

cinematographer uses either a home movie camera or a candid still camera!

No discussion of modern cinematography would be complete without at least some mention of special process cinematography. It is common knowledge that various "trick" photographic methods are used to a greater or lesser extent in the making of practically every modern feature picture. But a word of explanation is necessary as to why these are used.

Basically, there is but one reason for any special process shot. This is that by its use the picture can be improved. In some few instances, special-effects camerawork is called into play to film scenes which could be made in no other way; scenes which might—as in *The Invisible Man* and *Topper*—be impossible in real life. But in many more instances, the reason for using special camera effects is not to produce what might be termed a fake, but to film some normal action either more effectively, more efficiently or more safely than could otherwise be possible.

In no sense is this faking. Those few purists who decry special-effects shots as fakes should, to be consistent, also demand that an actor who plays a death scene should actually die.

It is easy to see that if the scenario demands scenes showing an Atlantic liner being torpedoed, the Empire State Building crashing in ruins, or a train or airplane being wrecked, the only economical way to bring this action to the screen is by camera trickery in which economical miniatures take the place of real full-size ships, skyscrapers, expresses or airliners. The actual cost of filming such action would normally be prohibitive for producer and public alike. And while there are still stunt men capable of crashing trains, autos and airplanes, and willing to risk their

lives in the process, neither the producer nor the public would willingly pay the potential price in human life just for a moment's thrill on the screen.

Other types of special process camerawork, such as the familiar projected-background or transparency process, in which the desired background is projected on a translucent screen behind the actors, are used for equally logical reasons. The more a production unit can shoot in the studio, where every possible element is under the control of director, cinematographer and sound engineer, the better will be the result and the more economically it can be obtained. After all is said and done, the important thing is the result presented on the screen. Whether the scene is produced by straightforward methods or by any form of special-process camerawork, if the scene is not so convincingly natural that the beholder forgets all thought of the mechanics of its making, that scene has failed its purpose.

The making of these important scenes is generally handled by the special-effects department, which consists of a corps of special process cinematographic specialists. But the scenes in which the principal players appear require the co-operation of the production's director of photography as well. Those dizzying transitions in which, for example, the incoming scene apparently pushes the previous one off the screen, or *wipes* in over it, are made by still other specialists in a device known as the *optical printer*, which rephotographs the already completed film and in the process permits a virtually unlimited range of special effects, adding or removing any part of the scene.

The latest development in cinematography is natural color photography. As far as the cinematographer is concerned, color brings some new problems and many new possibilities. In addition to the arrangement and quality of

the lighting, we must now also consider its color. Coloring must also be taken into consideration in planning compositions. Since the color camera splits the light-image up into three parts, we must use more light than we would for black and white. But aside from these relatively minor details, good natural color cinematography does not differ fundamentally from good black and white cinematography.

The full story of color cinematography has not yet been told, nor will it be until natural color productions are as common as today's black and white. When that will be—if ever—no one knows. But we do know that whenever that day comes, the cinematographer will be ready to carry on in color what he is today doing in black and white: translating not merely the physical form of each scene, but the mental and emotional imagery underlying them to the screen so that "going to the movies" is not merely a matter of watching a pictured story, but of feeling and living it with the characters.

XII

RECORDING AND RE-RECORDING

Nathan Levinson

INTRODUCED into the mad world of make-believe that singles out the motion picture from all other industrial creations, the wedding of the art of sound-recording to the already established art of photography completely transformed one of the world's largest industries overnight. No mechanical invention heralded its coming; no single technical development spelled its success. Born of a fusion of the sciences of electronics, acoustics, optics, mechanics and photography, the science of sound-recording has drawn freely upon the accumulated knowledge of workers in all of these fields for its growth and refinement.

Edison has generally been given credit for the first successful recording and reproduction of speech and music. Lacking the high-quality microphones, amplifying equipment, and electrical aids of today, the early sound-recording mechanisms of Edison were actuated solely by the almost infinitesimal quantity of energy present in the sound waves being recorded. Similarly, the lack of suitable amplifiers and loud-speaker mechanisms limited the maximum amount of power available to operate his sound-reproducers to that derived directly from the actuation of a reproducing stylus by the wax cylinder.

Although Edison's first successful recordings date back

to the year 1877, it was not until 1891 that he developed his Kinetoscope, which enabled a single observer to see an animated picture of some thirty seconds' duration. In 1895 Lumière's Cinematographe made possible the photography and projection of a rapidly recurring series of images to an audience of moderate size.

The development of motion-picture photography and projection from this time on continued at a rapid pace, but the numerous attempts to combine the projection of sound and picture made during the early years of motion-picture development met with little success. The problems of synchronization of sound and action during the production and projection of a motion-picture scene, and the restrictions placed upon the freedom of the actor and the camera to insure a definite result, were so severe that many such attempts by leading scientists never went beyond the experimental stage. Consequently the talking motion picture seemed as remote an accomplishment in the year 1920 as it had a quarter of a century earlier.

But, as so often happens in scientific research, help arrived through the medium of an almost abstract discovery. Fleming, in his early attempts to perfect the radio detector, invented the two-element vacuum tube. De Forest added a third element, and an electrical amplifying device was born. Arnold and a group of associates in the Western Electric Company had by 1915 brought the development of the vacuum tube amplifier to the point where transcontinental telephony became an accomplished fact.

The year 1920 witnessed the erection of the first radio-broadcasting transmitter in this country. In the succeeding three years several hundred additional transmitters were built and placed in operation for the release of entertainment, education, and news broadcasts. Radio receivers were

constructed by the millions, and installed for the reception of these broadcasts. A new medium had been created which enabled artists and performers to play to audiences of untold numbers. The requirements for high-quality sound transmission and reception acted as a tremendous stimulant to the development of electrical communication equipment. Development followed development in bewildering array until the high-quality microphones, amplifiers, and loud-speaker mechanisms of today are available to all, and because of these developments the earlier feeble signal-currents of Edison can now be amplified to the point where they can literally shatter the loud-speaker diaphragms.

To combat the popularity of the radio receiver in the home entertainment field, the phonograph industry availed itself of developments in electrical communication, and in 1925 presented the first electrical recordings and electrical phonographs to the public.

With the development of electrical recording and reproduction from disc records there came the further realization that this medium would make possible a presentation of sound to accompany the motion picture. Further developments eliminated the difficulty of synchronization, which had long been a stumbling block, and insured perfect timing of the voice with the action on the screen. Synchronized sound and pictures became, at last, a completed laboratory accomplishment.

Many attempts by representatives of the Bell Telephone Laboratories and the Western Electric Company to interest the various motion-picture companies in the possibilities of talking pictures resulted in little or no enthusiasm on the part of the motion-picture producers. One group headed by the Warner brothers, when approached by the writer, immediately appreciated the possibilities of the scientific

miracle offered to them. Employing every resource at their command, but with not a few misgivings, they undertook a year of development work and produced several short subjects. After they had proven to themselves the feasibility of producing talking motion pictures, they produced the first commercial feature-length, synchronized-sound motion picture—the Vitaphone release, *Don Juan*. Its first public showing was at the Warner Theater in New York City, August 6, 1926. The screen had at last acquired a voice. And, of equal importance, further Vitaphone releases indicated definite and gratifying audience approval. The overwhelming reception of *The Jazz Singer*, released for public exhibition in October, 1927, resulted in the complete capitulation of the Hollywood producing organizations and precipitated a frantic scramble to secure the equipment necessary for large-scale production of talking motion pictures.

This much is history. The intervening years have witnessed the establishment of well organized and elaborately equipped sound departments in every motion-picture studio in the world. Recording of sound on wax discs for motion-picture audience purposes has yielded to methods of recording sound on motion-picture film, which facilitates the editing of the sound record and insures perfect synchronization of the sound and picture.

A complete exposition of the technique employed, the difficulties encountered, and the engineering feats accomplished by those charged with the responsibility of creating a perfect aural illusion to accompany the visual one upon the screen can scarcely be presented within the confines of a single book. We can only attempt, therefore, within the following few pages to indicate in a general way the present-day methods of creating the voice of the screen.

The personnel of a studio sound department is headed by the director of sound recording. His position is necessarily both administrative and technical in character. He has complete authority with regard to his personnel, technique of operation, and all of the engineering and operating aspects of his recording equipment. His responsibility is to secure the best sound possible at a reasonable cost of operation and under a wide variety of recording conditions. Generally an engineer by profession, the sound director must be appreciative of the fact that he is surrounded by people in many branches of creative arts, and that his success lies largely in his ability to co-ordinate the technical efforts of his department with the work of his associates. The sound director often exercises control of the recording during the laboratory processing of the film and the selection and servicing of the projection equipment in the theaters.

The varied nature of the work of the sound department of a major studio means that the sound director must have a number of capable assistants to handle the many branches of the work for him. His chief engineer is responsible for all the purely technical phases of operation, from the installation, operation and maintenance of the equipment to the development of improved equipment and methods which will facilitate the physical problems of recording and reproduction. The chief *mixer* furnishes the working contact between the sound director and the various staff units working on each picture. He checks the daily product, and is often responsible for supervising the many recording and re-recording operations necessary before the final release is made. Supervision over those men who actually operate the recording machines is frequently delegated to a chief recorder. The actual supervision of the operation and

maintenance of the recording circuits and associated equipment is supervised by several operating transmission engineers, who are directly responsible to the chief engineer. The larger studio sound departments maintain small research and development groups for the purpose of improving the equipment and the recording processes to secure greater sound fidelity in the finished product.

The sound crew assigned to a producing unit normally consists of three men. This group is headed by the mixer, who is directly responsible for proper positioning of the microphones on the set, control of the sound volume recorded, and for the acceptance or rejection of each recording made on the basis of the quality and perspective of the sound as judged through his monitoring system. The mixer is often an engineer, although not necessarily so. He should be capable of critical appreciation of the quality and general character of the sound required to match the action portrayed.

The mixer's assistants are known as *stage helpers*, their duties consisting of providing proper suspensions for the microphones, connection of the various microphones to their associated amplifiers and to the mixer panels, and generally carrying out the mixer's instructions as to the handling of the microphones during recording. The stage helper rarely has extensive engineering training, although it is extremely desirable that he possess at least an elementary knowledge of acoustics so that he may be of the greatest possible assistance to the mixer in placement and control of the microphone positions.

The remaining member of the sound crew is the *recorder*, who is responsible for the operation of the recording machine and its auxiliary equipment, and, in some cases, for the operation and maintenance of all the recording

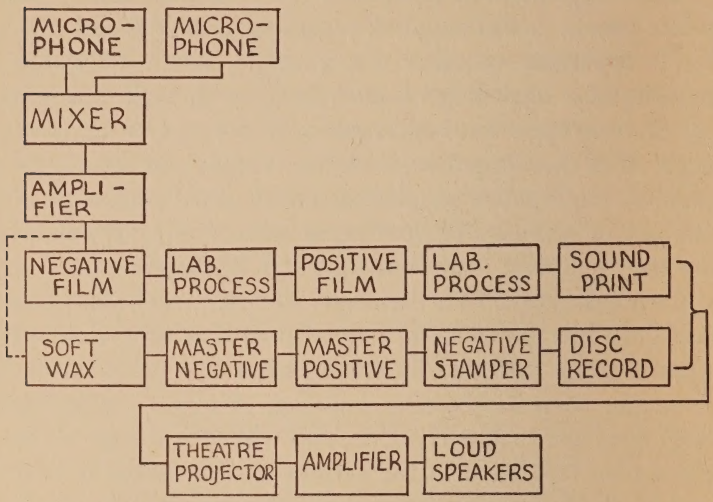
channel equipment. This man is usually a highly trained technician who possesses at least a working knowledge of the fundamental principles of amplifier operation and testing, optical system adjustments, and film recording and processing technique.

The complement of equipment—microphones, amplifiers, mixer panels, power supplies, recording machines and auxiliary apparatus—required for a single sound recording constitutes a recording *channel.* In general, such channels are of two types: fixed and mobile. In the case of the fixed type, all of the equipment, with the exception of the microphones, microphone amplifiers, mixer panel and a small amount of auxiliary equipment, is located in a central recording building, with underground circuits connecting the equipment used on the stages to that in the recording building. The mobile recording channel is usually mounted upon a truck and may be employed at any point remote from the central recording building. A major studio has both fixed and mobile channels, and while the design of the equipment employed in the various studios differs considerably, the functions of the units are quite similar.

It may be of interest to the reader to trace the steps in recording from the time the sound is spoken on the stage until it is projected from the loud-speaker behind the screen in the theater. Sound waves are picked up by the microphone on the set and converted into a feeble electrical current. This electrical current is amplified thousands of times by special microphone amplifiers, and transferred to the mixer panel where its volume is controlled and where the sounds picked up by microphones in use are combined in proper proportion. The combined sound from all the microphones passes from the mixer panel through connect-

ing cables to the main recording amplifier where its energy is again multiplied tens of millions of times.

The electrical energy when it leaves the main recording amplifier is divided and delivered in proper proportion to the recording machine and to additional amplifiers, from

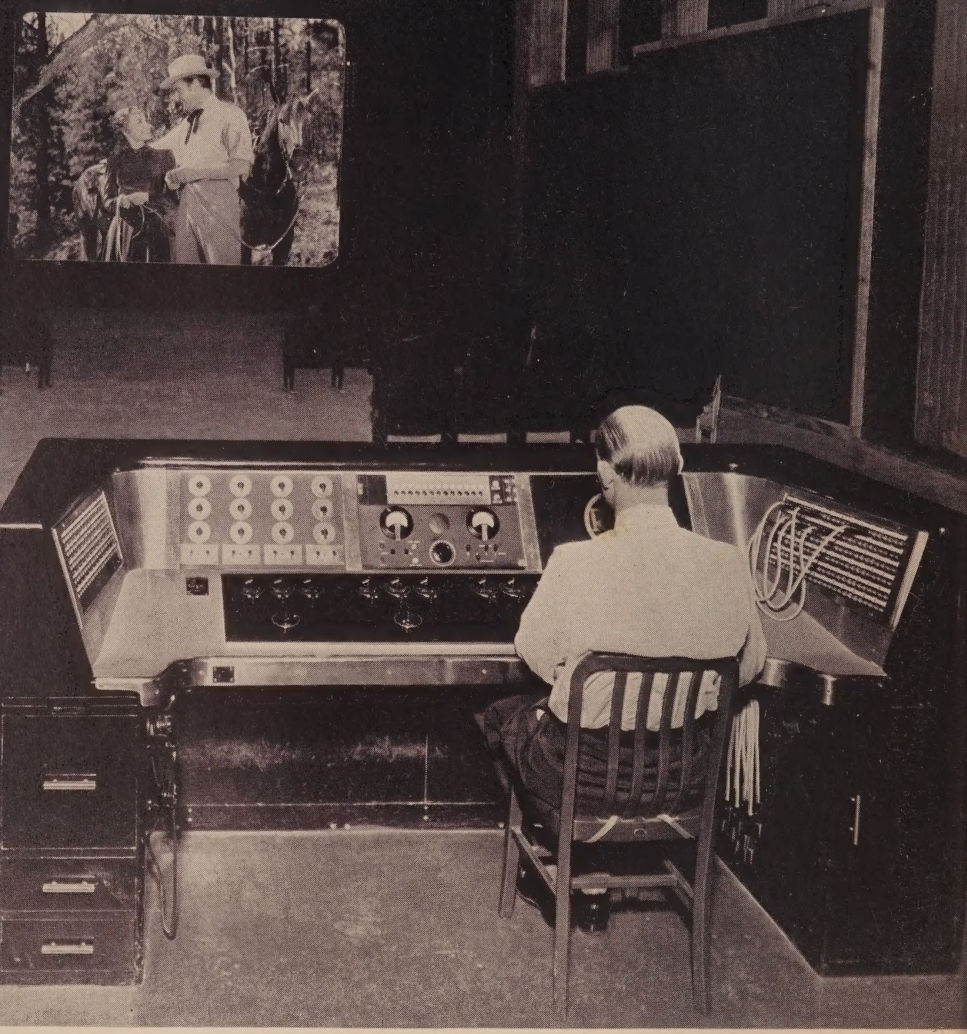


An illustrated diagram of the process of the recording and reproduction of sound.

whence it is distributed to the mixer and recorder monitoring systems. The monitoring systems consist of either head phone or loud-speaker equipments capable of reproducing the sound originally picked up by the microphones with a high degree of fidelity.

The film-recording machine is a camera of extremely precise construction. When the recording machine is in operation the film, as it passes a certain point, receives an exposure which when developed is a photograph of the

The sound-recording crew in action on the set. The sound mixer in the foreground listens through head phones to the actors' voices and adjusts them at the mixing console. His assistant, the stage helper, stands beside the microphone boom. An electrician may be seen on the cat-walk, to which the lights are attached above the set. (Courtesy of Warner Brothers Pictures.)



A re-recording room showing the mixer at the console where he combines the sound tracks of speech, music and sound effects on one track to fit the picture. Each dial of the console adjusts the volume of a different sound track. (*Courtesy of Warner Brothers Pictures.*)

sound picked up by the microphone at that instant, which has been converted into electrical energy. This electrical energy is then converted into mechanical energy by passing through a pair of very fine wires, which are a part of either a recording light valve or galvanometer. The movement of these fine wires permits the film to become exposed to a greater or lesser degree, depending upon the type and quantity of electrical energy creating the movement. A light valve consists of a loop of duraluminum ribbon suspended in a magnetic field. The normal spacing of the two halves of the loop is only one one-thousandth of an inch, and constitutes the slit which allows a given amount of light from a lamp to pass through an appropriate lens system and fall on the film. As the electrical currents corresponding to the original sound as picked up by the microphones pass through the ribbon, the loop alternately widens and narrows in accordance with the intensity and frequency of these current changes, and expose the film accordingly. The resulting recording is known as a *variable density* track.

A recording galvanometer also consists of a loop of ribbon in a magnetic field. However, the light, instead of passing through the loop, strikes a small mirror cemented on the ribbons, which reflects the light through a suitable lens system on to the film. Speech currents in the ribbons twist the mirror from side to side, resulting in a film exposure of *variable width* or *variable area*, as it is sometimes called. In reproduction, either of the sound tracks described serves to vary the amount of light falling on a photo-electric cell, which in turn translates the light intensities into electrical currents. These currents, when amplified and delivered to loud-speakers, produce sound corresponding to that originally picked up by the microphone.

When recordings are made on discs instead of film, the electrical energy from the recording amplifier is delivered to a wax-cutting tool. This tool holds a stylus which is caused to move in a lateral or vertical motion in accordance with the electrical currents, so that grooves are cut in the surface of a smoothly polished soft wax disc.

The soft waxes are processed by first dusting their surface with fine graphite. An electrical connection is made to the graphite and the wax is immersed in an electroplating bath. The electrolytic action causes a thin sheet of copper to be formed on the face of the wax. This sheet follows faithfully every groove in the wax, and is called the *master negative* or *matrix*. The next step is to electroplate the master negative to obtain one or more master positive records called *mother records*. These *mothers* are of metal and serve to produce, by electroplating, several *stampers*. The stampers are used as a die in a hydraulic press where their grooves are impressed in record material under heat and pressure to form the familiar, hard black disc record.

The motion-picture cameras and the film- or wax-recording machines are driven in perfect synchronism by electric motors normally controlled from the station of the recorder. It is extremely important that all motors connected to the system rotate at exactly the same speed, as the picture is photographed on one film in a picture camera on the stage while the sound is recorded on a second film or wax in the recording room which may be located in a distant recording building. This is accomplished by electrically interlocking all motors of the system so that they all rotate in step with each other.

Fully three-fourths of all studio recording is carried on in sound stages. These buildings vary in size from fifty feet in width by sixty feet in length, to two hundred feet in

width by three hundred feet in length. Most of these stages are of extremely rigid construction and have been designed with particular care to prevent the transmission of sound through walls, ceilings and doors. Many of the larger stages are provided with elaborate ventilating systems, for the quantity of heat generated by the various arc and incandescent lamps employed in set lighting is sufficient to raise the temperature of the stage interior to an uncomfortably high degree. The humidity of the air must be controlled as well as the temperature. A ventilating system on a typical large stage removes sixty gallons of water from the air every hour.

Preparation for recording sound for a picture is usually started several days before actual production of the picture gets under way. Copies of the final script are supplied to the sound director and the chief mixer, who study these to determine the nature and scope of any special recording equipment which might be required. A sound crew and suitable equipment are then assigned to the new company.

The members of the sound crew each day report to their posts approximately an hour before actual production of the picture is started. Microphones are suspended, the necessary power and signal cables are connected, motor and synchronizing circuits are tested, and transmission tests are completed from stage microphones to the recording machine. The scene to be shot is carefully rehearsed by the players, the mixer meanwhile carefully checking the balance between his microphones and the quality of the sound pick-up through his monitor system. The recorder is simultaneously making ready his equipment and checking the sound volume delivered to the recording machine. He punches or otherwise impresses on the film in the recording machine a combination of letters and numerals which per-

manently identify each scene made during the picture.

When rehearsals have been completed to the satisfaction of the director, he signals the mixer for a take. The mixer, by means of a buzzer or signal light system, transmits this information to the recorder, who thereupon immediately starts the motor system. When the system has attained a normal running speed he supplies an electrical synchronizing impulse to the camera on the stage, and the action of the scene is started. Upon completion of a take the mixer signals this information to the recorder, who thereupon stops the motor system, repunches or otherwise marks the film for the next scene, and checks his equipment to insure its continued proper functioning. If carried through to completion successfully, and found suitable from the directorial, photographic and sound standpoints, the scene is *choiced* or approved for laboratory processing. If director, cinematographer or mixer feels that an improvement can be effected, the scene is retaken until all concerned feel that further attempts would scarcely result in better takes than those already made.

The director indicates the disposition to be made of the various scenes, and this information is carefully recorded upon the mixer's log sheets and the recorder's film report. At the end of a day's work the exposed negative, together with attached film report cards, is sent to the film laboratory for processing.

Not all stage recording is as straightforward as that described above. Many scenes call for the photography and recording of large dance ensembles, orchestral accompaniment to vocalists, tap-dancing teams or similar numbers. The difficulty and expense involved in rehearsing a large orchestra, in addition to the principals appearing in such scenes, frequently make it advisable to employ an artifice

known as *pre-recording* or pre-scoring. The band or orchestra, without being photographed, makes a recording of the number as it is to be used in the final picture. Simultaneously with the recording of the music on film, several corresponding disc records are made. The actors are rehearsed and photographed to the tempo of these discs which are reproduced or played back at the identical speed at which they were recorded. The scene thus photographed to the music from the pre-recorded disc will be in synchronism with the recording on the film throughout its length, and in this manner we are enabled to produce large musical numbers giving the directors and actors the greatest latitude possible in photography without the necessity of thinking further of the sound recording. If the orchestra which played for the pre-recording sound record is to appear in the scene, its members go through all the motions of playing their instruments or actually do play the instruments, being at all times extremely careful to play in synchronism with the music reproduced from the pre-recorded records. Ordinarily no sound is recorded during the photographing of these scenes, as the record made during the process of pre-recording serves the purpose. If the number being photographed to a pre-recorded record involves dialogue between any of those taking part in the scene, only the dialogue is recorded as the scene is photographed, and the music is stopped during such recording. Later, while in the process of re-recording or finishing the production, the proper combination or blending of the dialogue and music is effected.

Fundamentally the recording technique employed while a company is on location differs only in minor respects from that employed in the studio. The equipment being somewhat smaller and generally more portable than that

used in connection with the fixed studio channels, the mixer can almost always so dispose his equipment that he may occupy a position close to the action being photographed. On a clear, quiet day the difficulties of location recording are scarcely greater than those in the studio, but windy or rainy weather creates pick-up conditions seldom encountered on the closed stages. The noise induced in the microphone due to gusts of wind or to the patter of rain drops is often so great in intensity as to blanket the actors' dialogue. Numerous ingenious devices, few of which have ever been submitted as examples of contemporary art, have been devised as protective coverings for microphones. These have come to be known as *wind gags* and *rain gags*, and consist of a wire framework covered by a light silk or linen cloth. Although not capable of completely eliminating disturbances due to wind or rain, they are of sufficient value to enable recording to be carried on when it would otherwise be impossible.

While the great majority of locations chosen are within fifty or a hundred miles of the main studio plant, it frequently happens that complete recording units must be shipped across the continent or even to foreign countries. When such occasions arise, the choice of the sound personnel must be made with extreme care, for the bulk, weight and cost of any great amount of spare equipment renders its inclusion impracticable. The men chosen for the more distant locations must not only be capable of securing the maximum from their equipment in the way of quality, but must also be qualified to make such tests and repairs as may from time to time be required to permit its continued operation.

At the conclusion of each day's production, the sound negative is forwarded to the film laboratory by whatever

form of transportation may be available. Both picture and sound are viewed at the earliest opportunity, for only in this way can defects in photography and recording be recognized sufficiently early to avoid costly retakes.

Practically every sound picture released for the purpose of entertainment is equipped with an appropriate and often elaborate musical score. The typical feature picture is scored by a studio orchestra maintained for this purpose, although occasionally the more pretentious pictures employ the services of various nationally and internationally known musical groups. The score for each picture is written to suit the moods and tempos of the various scenes, and the music found suitable for one picture is seldom, if ever, later employed in another.

Most music scoring is done on stages which have been specifically designed for this purpose. The general stage construction is similar to that of the other sound stages, differing principally in that the acoustical treatment of the walls, floor and ceiling is given great consideration. A motion-picture screen fitted to the stage wall in such position as to be clearly visible to the orchestra conductor and the sound mixer, and appropriate motion-picture projection equipment, enables those immediately concerned to accurately fit the tempo and length of each musical sequence to the corresponding picture action.

The sound-recording equipment employed for scoring is usually identical to that used for company recording, with the possible exception of more elaborate channel supervisory and communication equipment. The mixer panel, or console, is often built into a small room immediately adjacent to the scoring stage. Double plate-glass window construction affords the mixer a view of the musicians and the conductor, yet provides sufficient sound insulation between

the stage and the booth so the mixer is not confused by sounds from the stage combining with those from his monitor speaker system.

Each reel of the picture is scored in sections, the numerous choice takes being later spliced to form a continuous sound track. One advantage of this mode of operation lies in the fact that after a number of relatively short rehearsals the musicians are able to give a practically flawless performance, while if an entire reel were scored during a single continuous take, the physical and mental strain would be greater on all concerned. Since a beautifully written and ably executed musical score is of inestimable aid in establishing the excellence of a motion-picture production, sound engineers spare no effort to secure the finest possible music recording.

Musical scoring as generally practiced might be classed as a post-recording process, since it is rarely begun until photography and editing of the picture are completed. The process of post-recording is also occasionally applied to the recording of dialogue or vocal solos. The section of film to be post-recorded is projected upon the screen, and microphones are so suspended that the performer can readily view the image thrown upon the screen and at the same time conveniently speak or sing into the microphone. The motor system used to drive the sound-recording machine also supplies the necessary power to the motion-picture projection machine, so that both machines run at exactly the same speed. The performer rehearses the part several times, attempting perfectly to synchronize lip movements with those appearing upon the screen, and then makes a recording of the required material. While the mixer assigned to handle post-recording work is wholly responsible for securing a satisfactory degree of synchronization be-

tween sound and picture, he seldom experiences any great difficulty for many of the screen players have developed an almost uncanny ability for this type of work. Children especially have a fine sense of timing their dialogue to lip movements on the screen.

The many thousands of feet of sound negative exposed during each day of production are in themselves of little value until properly processed, printed and assembled with the corresponding picture scenes. These and other related operations are the work of the film laboratory.

Separate prints are made from the picture and sound negatives. These prints are then passed through a double re-wind mechanism, and the corresponding start marks on each film are accurately aligned at the beginning of each of the takes comprising the reel. Following synchronization of the prints, they are delivered to the studio editing department. From this point the film is distributed to the various studio projection rooms, where the directors, players, cameramen, editors, sound engineers and others concerned check the daily product, after which the prints are distributed to the editors assigned to the pictures in progress. The daily inspection of sound and picture affords the sound department an opportunity to check the operation of each recording channel in service, and to make such changes in equipment or technique as may occasionally be required to maintain a high standard of quality.

Preliminary assembly of the numerous scenes comprising a picture is usually started shortly after the arrival of the first day's prints from the film laboratory. The film editor assembles the various picture and sound scenes in accordance with the general instructions issued by the production supervisor, attempting to secure through the judicious intercutting of medium shots, long shots and close-

ups a vibrant and dynamic, though smoothly flowing, exposition of the screen narrative. At the completion of the preliminary picture assembly, the total film footage involved may exceed that appearing in the theater release print by anywhere from two to ten times. An example of the painstaking care used in editing a production can be gathered when it is realized that only about 8 per cent of the original film shot on a picture appears in the final release print as it is shown in the theaters.

The following stages in the process of film editing are principally concerned with the partial or complete removal from the picture of numerous scenes appearing in the original assembly, the objective being that of injecting a strong sense of movement in the narrative without in any way impairing the continuity or logical unfolding of the story.

Following completion of the latter stages in the editing process, the *work print* is viewed by representatives of the various departments concerned with the completion of the picture, after which the work print is turned over to the sound department for final re-recording.

The process of sound re-recording forms one of the most interesting and vital of those involved in the production of sound motion pictures. It is in this process that the numerous "sound effects" which add the final touch of realism to the picture are normally introduced—where the musical score is interwoven with the dialogue and sound effects—and where the dramatic control of sound volume is finally exercised. Because of the intricate nature of these various operations it is customary for the sound department to maintain a separate group of engineers and technicians whose efforts are devoted exclusively to the task of re-recording.

Every theater patron has, through years of co-ordination of the senses of sight and hearing, grown accustomed to the existence of various types of sounds for the various physical actions and processes he or she has observed. It is only natural, therefore, that the highest degree of screen realism can be achieved only when each bit of action portrayed is accompanied by the sounds appropriate to the screen image. It is, unfortunately, frequently economically or physically impossible to record on each stage or location the particular sounds appropriate to the action being photographed. Real thunder is a true rarity in Hollywood; the wind seldom howls eerily through the rafters of the sound stage; miniature explosions are generally unaccompanied by a soul-satisfying roar; the sounds of automobiles, trains, steamships and aircraft are often quite impossible to produce upon the stage, and science has not yet attained that command over the earth whereby disastrous earthquakes can be produced at the command of the motion-picture director. One of the few avenues through which these and many other types of sound may be introduced into the picture is through the process of re-recording.

Following receipt of the picture work print by the sound re-recording group, the various reels of picture and sound track are reproduced in review rooms to ascertain the nature of the sound effects required to establish a satisfactory illusion of reality, to choose those scenes in which the musical score should predominate over all other sound, to determine the relative importance of background music and dialogue in the various scenes, and to note those sequences which require unusual accentuation or suppression of sound to heighten the dramatic or comedy effect. The sound-track editors or cutters then proceed to assemble the various reels of music, dialogue and sound effects which

are to be electrically combined to form the finished sound track. Most studios have, over a period of years, built up elaborate libraries of sound effects, in which thousands of feet of film bearing the records of innumerable sounds of everyday life are systematically filed. Additions are made to these libraries from time to time as equipment and opportunity afford or as production may require. In the early days when sound equipment was less faithful in recording than it is today, the sound of horses' hoofs, railroad trains and lion roars were produced synthetically by means of cocoanut shells, roller skates on wood, and resin strings. Now almost all sound effects heard in pictures are recordings of the actual sounds themselves—from the chirping of crickets to the peals of thunder. Every effort is made to insure that each bit of sound added to the picture shall be appropriate to and exactly synchronized with its corresponding action. All in all, the preparation of the various sound tracks for the process of re-recording is a more elaborate task than the recording of the original dialogue and music for the picture. When all is in readiness for the actual process of re-recording, it is customary to find that anywhere from two to ten or more individual sound tracks are required for the composition of the single release negative.

The re-recording machines employed for the reproduction of sound from the various individual sound tracks involved are similar in principle of operation to the sound reproducers employed in the theater. An incandescent lamp illuminates a very narrow mechanical slit in the path of the light beam. A sharp image of this illuminated slit is formed in the plane of the film as it passes through the re-recording machine, the image being accurately centered upon the area of the film occupied by the sound track. The sound track

passes between an incandescent lamp and a photo-electric cell. The variations in opacity of the film representing the sounds recorded thereon create corresponding variations of intensity in the light falling on the cell. The variations in light intensity create corresponding variations in the electrical current flow through the cell. The electrical output of the photo-electric cell is amplified millions of times by suitable vacuum tube amplifiers, and actuates the light valve or galvanometer of a recording machine.

The electrical output of each re-recording machine is controlled manually by the re-recording mixer, who combines the outputs of the various re-recording machines in any desired proportions. The motors of the re-recording and recording machine operate in synchronism. A portion of the electrical energy from the re-recording amplifiers is employed to actuate a monitoring loud-speaker system by means of which the mixer is enabled to judge the quality and composition of the re-recorded sound track during the process of re-recording. With the exception of the re-recording machines, the re-recording channel differs in only minor respects from the channels employed for original recording.

Depending somewhat upon the character of the sound track involved, a complete reel may be re-recorded in a single operation or may be split up into a number of short sequences, which are later spliced to form a single continuous track. Under either mode of operation each sequence is preceded by a number of rehearsals to permit the mixer to thoroughly familiarize himself with the material to be re-recorded, and to permit him to establish certain equipment settings and adjustments necessary to the successful combination of the various sound tracks involved in a single new track.

The new sound-track negative obtained through the process of re-recording is processed in the film laboratory in a manner identical to that employed for the original sound track. The method of printing this negative, however, differs from that employed for the original. The picture negative, cut to match the editor's work print, and the re-recorded sound negative are now printed upon the same piece of film, the sound track lying between the space occupied by the picture itself and the sprocket holes at the edge of the film. The "start" of the sound track and the "start" of the picture are, moreover, displaced along the length of the film by a distance of approximately fourteen and a half inches, so that at the instant that a given frame of the picture appears in the picture aperture of the theater projection machine the corresponding point of the sound track is between the lamp and the photo cell in the projection machine sound head. This separation is necessitated by the fact that each frame of the picture is momentarily held stationary in the picture aperture during its projection upon the screen, the picture advancing through the aperture in a series of discrete steps, whereas the sound track must pass the light beam with a uniform and continuous motion. The fourteen-and-a-half-inch separation between the various picture frames and the corresponding points of the sound track permits completely independent control of the film motion at the two apertures.

The composite print of picture and sound track is now returned to the sound department for inspection and such corrections as may appear desirable. The relative sound volume of various sections of the print may require modification to produce desired effects, necessitating a second re-recording of those portions of the print concerned, or suitable change in the exposure of those sections of the

print. Following completion of the necessary modifications to the track, the laboratory submits a second composite print for inspection and if, as is usually the case, this proves satisfactory, the print is ready for the approval of the production supervisors.

A majority of the feature productions and many of the less pretentious pictures are previewed in local theaters for the purpose of determining audience reaction. Following these previews, the fate of the picture is decided through conference of the various production executives. If the picture is approved without alteration, the film laboratory is ordered to prepare the required number of prints for theater release. If, on the other hand, extensive recutting of the picture seems advisable, the sound department is faced with the necessity of repeating much of the work of re-recording already performed.

The preparation of release prints for a feature production would indeed be a hazardous undertaking if none other than the original sound and picture negatives were available. These negatives represent the entire financial investment of each production, and must be printed from a hundred to four hundred times to secure the number of prints required for exhibition in American theaters alone. It is, therefore, evident that abrasion or breakage of the negative would result in an intolerable loss to the studio if no form of protection other than careful handling of the negatives were assured. Fortunately, insurance against such loss is afforded through the medium of photographic duplication of the original negatives. This process is a relatively simple and direct one, though critical in its demands upon laboratory control.

The negatives to be duplicated are first individually printed upon a lavender-base duplicating stock. The re-

sultant print is similar to a normal print upon positive film, but is more faithful in its rendition of tone and fine detail. After processing in a normal positive developer, the lavender prints are themselves employed as negatives. Prints from them are made on sound-recording film or picture-negative stock as the nature of the lavenders may demand. This second set of prints becomes, upon suitable development, the duplicate of the original negatives employed in the process, and provides not only a form of insurance against destruction of the original negatives but also a negative which may be used at will. At least one print from each of the duplicate negatives produced is submitted for approval of the sound department before being employed for printing or packed for shipment.

Each print released from the film laboratory for use in the theater must conform to certain accepted standards relating to over-all length, form, position of picture title, reel designation, length of blank leader at the beginning and end of the reel, and to the position and number of cue marks which notify the theater projectionist of an approaching change-over. A majority of the film laboratories inspect each reel of film printed for theater release by projecting the prints upon viewing screens before shipping the film to the exchanges.

To enable a continuous performance on the theater screen, a minimum of two projection machines is required in every theater. While one reel of a picture is being projected by one of the machines, the projectionist is free to thread up the second machine and prepare it for operation. Each reel of a picture bears two sets of cue marks a short distance from the end. The first of these serves as a warning to the projectionist to start the motor of the idle projection machine, and the second serves as an indication

of the instant at which projection must be transferred from the outgoing to the incoming machine. Skillful operation of the projection equipment permits the theater patron to view hours of screen entertainment without the slightest knowledge of the many operational transitions from one projection machine to the other.

The projection of a picture in the theater marks the culmination of months and sometimes years of effort on the part of the motion-picture producer. The excellence of a production can only be fully realized if the theater-projection equipment is of an equal degree of excellence to that of the picture camera and sound-recording equipment employed in making the picture at the studio. Maintenance and operation of the projection equipment should be entrusted only to properly trained projectionists, for many of the elements of the projection system are the refined product of years of engineering research and design, and successful operation of the equipment requires more than a superficial knowledge of mechanical and electrical principles.

The experienced projectionist takes much pride in the flawless performance of the equipment under his supervision. The rarity of complete failure of theater-projection equipment is in itself a remarkable tribute to the excellence of design, construction and maintenance of the thousands of such equipments in daily service.

Thus, in brief, is the sound motion picture created and reproduced. Progress and refinement in the art of recording and projection of sound continues, as in the case of other highly technical industries, at a rate governed largely by the scope of laboratory research directed toward this end. Generally speaking, startling or revolutionary developments in the art are quite infrequent, the progress made

consisting rather of the gradual but continuous improvement of each of the units comprising the chain of equipment from microphone to theater loud-speakers. The ultimate aim of the recording engineer is to secure such a degree of realism in recording and reproduction that sound from the screen appears to be identical with the sound which originated during the photographing of the scene.

XIII

CUTTING THE FILM

Anne Bauchens

MANY people ask me what film editing is. I would say it is very much like a jigsaw puzzle, except that in a jigsaw puzzle the little pieces are all cut out in the various forms and you try to fit them together to make a picture, while in cutting films you have to cut your pieces first and then put them together.

I think this can be more clearly outlined if I start at the beginning of our work on each production. What I outline here, however, is not a set rule for all studios, as no two studios work exactly alike. Besides, different directors and producers work differently with their editors. Some directors stop work on a picture after the last scene has been shot. Then the producer takes the responsibility and does all the editing with the cutter or editor in the projection room. Other directors work very closely with the cutter and follow the film through until after the preview. A few insist on cutting their own pictures. But they are very scarce.

In most studios a cutter or editor, as he is sometimes called, and an assistant, are assigned to the picture about a week before production starts. In some studios, a first and second cutter are assigned, the second cutter being qualified to make a rough assembly of the picture as well

as doing the work of an assistant. The first cutter acts in the capacity of an editor.

A script is given to the cutter which he or she reads and studies to get a general idea of the type of story: dramatic, comedy, musical or spectacular, each of which is handled in a slightly different manner.

Generally the editors work very closely with the producer and as much as possible with the director. In some studios the editor stays on the set during the shooting. In that way he keeps in close touch with the director and has a better opportunity of learning why he shoots his scenes the way he does. Sometimes he makes suggestions if he feels the need of additional close-ups to help in editing. He is always watching for places where protection shots might be needed. These are shots taken from different angles which cover the action so completely that no retakes will be necessary. Protection shots are also used in editing to give variety to the telling of the story.

At the beginning of every scene a slate is photographed, on which the number of the scene to be shot, the production number and the cameraman's name are written. The same numbers are written on the sound track, so that the picture and track can easily be identified. When the scene is ready to be shot, after it has been slated, a mark of synchronization is put on the film in the camera and on the sound track in the recording room, so that the picture and sound will be in perfect synchronization. This *sync* mark, as it is called, can be made either by punching a hole in the picture and track, before the scene is shot, or by having the assistant cameraman clap two pieces of wood, or a *clapper*, together, so that the picture and corresponding sound are in sync at the beginning of the scene.

During the shooting, the script girl keeps an accurate account of each scene as it is made, its number slated on the film, the script scene to which it belongs, the number of cameras shooting (if more than one camera is being used, each with a different lens, to record long shots, medium shots and close-ups, simultaneously), the footage, a description of the scene and the dialogue. At the end of the day's shooting, a copy of the above is sent to the editor to aid him when he receives the rushes or daily. This daily is then sent to the laboratory, where it is developed and a positive print is made of both the picture and sound track. The scenes are then assembled on reels, the picture on one reel and the sound track on another. Since the motors of the camera and recording machine are interlocked, once the beginning of a shot is put in sync the whole film will be in sync also. The laboratory need only start the two reels of picture and track at the sync marks, and the rest of the film is automatically synchronized. The following day the film is sent to the cutting department with a laboratory report on the number of scenes included.

At the end of the shooting day the director, producer, editor, cameraman and sometimes the principal actors, assemble in the projection room assigned to them and run this daily, which comprises the scene shot on the previous day. I might explain here that sometimes in difficult scenes more than one camera is used, each lined up to get a different angle of the scene: one a long shot, another a close shot, perhaps a third from the side and a fourth from above. While three or four different shots are made of this scene, only one sound track is necessary, as the dialogue and action will be the same for all the shots. When the reels of daily are lined up for projection, each of these

shots, which have the same sync marks, are placed on separate reels. But all of them correspond with one track. Each scene has the same slate number at the beginning, but a different letter. For example, if the scene number is 23, one camera will use number 23A for a long shot, another 23B for a medium shot, and so forth. When these dailies or rushes are run in the projection room for the director, 23A will be run first with sound track number 23. Then, at the end of the projection, the operator will rewind the reel of track and run it with 23B, and so on, for as many takes as there are of this one scene.

The director then selects the take he wants. He can also see whether a scene could be improved by adding extra scenes or by retaking it. If this is the case, he makes the additional scenes on the following day.

The film is now turned over to the editor and his assistant, who takes the reels of the daily to the numbering room. There are generally two numbering machines to each room. The assistant puts the picture on one machine and the sound track on the other, threading it through as you would a projecting machine. He takes as his starting point the sync mark on the first scene of the reel, then fixes the number dial on each machine at 000 and starts the motor running. Automatically, every foot is numbered at the edge of the film until the end. The first foot from sync would be 001, and the last, if there were 800 feet on the reel, would be numbered 800. This numbering system always enables the cutter to keep his scenes in sync, so that the words will be spoken at the split second that an actor moves his lips to speak them.

The assistant cutter then breaks down this reel of scenes on to what is called a *flange* or split reel, which is put on the *rewind*, or metal support for the reels, on the cutting

bench. When he gets to the end of a scene he cuts it off with a pair of scissors, and by reversing the rewind he takes it off the flange in a roll, marks the slate number on the film, and puts a rubber band around it to hold it in place. After the daily has been completely broken down into rolls of film in this manner, it is usually lined up on the editor's bench in numerical order. The editor is now ready to start work.

One of the mechanical aids to the cutter is the *Moviola*, which is similar to a projection machine only much smaller. The picture is seen through a magnifying lens on one side, and the sound is heard on the other. The picture and track can be run together or separately. By using the Moviola the editor can be sure his cut on the sound track is right, and that he has not cut into the middle of a sentence. Similarly, he can be sure of not cutting into a movement which should be completed, and of matching action when going from one scene into another.

He assembles the scenes according to the script. He does not select the various shots merely to give variety to the picture. Each shot expresses a different phase of emotion or interest, depending on the type of story. Knowing this, he now tries to tell it by using each of these shots as effectively as possible. For instance, a long shot is an establishing shot to give the geographical location of the sequence. It could cover a battlefield, a city viewed from a hilltop, or a street or café. You might use ten feet of it, or again, you might use twenty-five or fifty feet, depending entirely on its beauty and how long you feel it will interest your audience.

Your next cut depends on where the interest in your story lies. Perhaps the camera has moved closer to any of the above scenes or closer to a group of people, so that

you would use a semi or medium shot. If your interest is focused on a group of people, a medium shot will help the audience to see distinctly what they are saying and doing. As your story grows more intimate you use closer shots, perhaps of two people or perhaps a large close-up of one of them, to accompany an interesting line of dialogue. If an important thought is to be registered you might use a close-up just of the eyes or the hands or any object which you want the audience to see clearly, such as a flower or a pistol. Then you might cut back to a medium shot of several people reacting to it.

You must always keep the audience's eyes focused on the main point of interest. There is no set rule how or when to use these various shots and angles. You know from experience that you cannot express a deep emotion or tell an important thought in a very long shot. It is not always necessary to tell it in a close-up of a face, but you should be able to see your character and know what he is thinking.

Much has been said about how directors waste film and shoot entirely too much which is never used. This may be true on rare occasions, but generally all this film is necessary. Most scenes are shot overlapping each other, so that there will be the same action on your group shot as on your individual close-ups. You can never be sure exactly which of these will best tell your story until you have cut it one way and then, if it does not look right, tried it another. The director who protects his picture in this way generally turns out a better picture than the one who is conservative and tries to cut his picture while shooting his scenes.

I have often been asked what methods are used in cutting different types of scenes, such as dramatic and com-

edy scenes. I cannot say there is any particular method or rule for cutting. Sometimes the length of the scene, sometimes its action, creates the tempo. My opinion is that we handle the feel and tempo of the picture entirely by instinct and feeling, and not by any set rule. We know that an emotional and a comedy scene must be cut differently. In a comedy you can cut back and forth much more often, since comedy is played in a much faster tempo. But you must be careful not to kill a laugh by cutting away from it too soon. For an emotional scene you use a much slower tempo, particularly if it has been well acted and directed. Sometimes you can hold an emotional scene for quite a long time on the screen.

Drama may be expressed in many different ways. When the suspense of the story is great, you can use many kinds of cuts to play it up and postpone the climax for a long time. For example, a *montage* might be used to heighten the suspense. This is a fast-moving group of short scenes, some symbolical, some real, which, when combined, represent some emotion or event. In *The Emperor's Candlesticks* a montage was used to hold the suspense until the final unraveling of the plot. Here were two spies, each of whom had an important document hidden in one of a pair of candlesticks, and neither knowing of the other's secret. The candlesticks are stolen, and they both set out to find them. For suspense, the candlesticks have been pawned. Each spy learns the address of the pawnbroker and meets there only to discover that the candlesticks have been sold to a collector. From then on the story follows both characters in a search for the missing candlesticks. These scenes might have been monotonous, and lacking in suspense, if the cutter had not made a montage of the following shots: Trains tearing through the country, wheels

of trains, names of hotels, faces of clerks behind hotel desks shaking their heads in negation, shots of a man and woman's feet walking rapidly along streets, and shots of the present owner of the candlesticks, always a jump ahead of the spies. This montage was carried as long as the suspense held. Then, when the man finally locates the missing pair being auctioned off at an antique dealer's and is about to buy it, he is intercepted by the woman spy, who appears and tries to outbid him.

Battles are often successfully presented by using montage. Here the horror and thrills are told more through suggestion than by actual scenes, such as flashes of faces in agony, feet stepping into mud, gun flashes and the wheels of cannon. The sound here often supplies as much of the psychological effect as an actual battle scene.

The process of cutting a film involves a number of mechanical steps. You begin with a *leader* or short strip of blank film, one for the picture and one for the track, marking on it the number of the reel you are cutting. Then you cut in your first scene, possibly a long shot, with its corresponding track, always running it through to make sure it is in sync. You attach the beginning of the cut film to the leader with an ordinary paper clip. Then, when you are ready to cut in your next shot, you carefully examine the scene to be sure you are not cutting on a word or bad movement. You mark the place you want to cut with a grease pencil. Then you take the scene you have decided will follow this and match its action as closely as possible with your last shot. If it is a long shot of one character sitting in a chair and another turning away from him, you must be certain that your second shot, which might be a medium shot, matches the action of the man's

turning. Otherwise the transition between the two shots will be too jerky.

The pieces of film which are cut away as waste are called *trims*. These are hung on small nails in the bin beside your cutting bench. The bin is a wooden or metal box, about six feet long by three feet wide and about four feet deep. A narrow wooden piece, about one and a half inches wide, is fastened to each end of the bin, and extends above it about three feet. A rack is formed by a crosspiece which joins the two ends, forming a frame. Fine hooked nails run along both sides of this rack, on which you hang the ends of the trims, letting the balance of the film fall into the bin.

After you have finished a sequence the assistant rolls up these trims, marks them for identification, and puts them in metal cans which he then files away in special racks. When we want to make changes or use any part of the scene we have not already used, or if we want to lengthen a cut, we can always find the trims quickly. Now, you fasten the long shot and the medium shot together with a clip, in the same way that you fastened the long shot and the leader, and continue this process with each cut until you have assembled a full reel of scenes.

The assistant takes the reel to the splicing room and splices each scene together with film cement. In making your cuts you have allowed exactly two *sprockets*, or half a frame, over the end of the picture and sound track and the beginning of the next scene and track for this purpose. The two ends are placed on the splicing machine in the grooves made for it, and the emulsion scraped off one side with a blade. The assistant puts a little cement on the scraped edge with a small brush, and quickly clamps down on it with the side of the machine holding the other scene.

He holds down the machine a second, then releases it and a splice has been made. He must be careful to see that the frame line of one scene exactly fits the frame line of the next. Otherwise, when the film is projected, it will be thrown out of frame. He repeats this process all through the reel at every cut, replacing the clip with a splice. This work print, or *rough cut,* as it is called, is then ready for projection. We generally run it through alone first, to be sure that every scene is properly synchronized and to see whether we can improve any of the sequences. Sometimes we must recut certain scenes before showing the film to the director and producer. Then, after recutting it, we run it for them in the studio projection room, and they give their criticisms and suggest any changes. At this point the director expresses any effects he would like to accomplish through the editing. The conference over, we take the film back to the cutting room, and again go through it and recut it. We do this until all agree that the picture feels right. Now it is ready for the final stages before being previewed in a local theater.

The various devices used in films for bridging time lapses or marking transitions between scenes, such as fades, *dissolves* and wipes, must be inserted here. A fade-out is used at the end of a sequence to denote a lapse of time or a complete change of thought. It is made in the laboratory by a chemical process used on the negative, which literally fades the scene off the film at the place indicated by the cutter, and leaves the film black for whatever footage we may require. This same process, when used for the beginning of a sequence, is called a *fade-in.* Here the process is reversed: the film starts as black and clears until the image becomes distinct. The two processes are always used

together: when you fade-out on a sequence, you always fade-in on the following sequence.

Dissolves, wipes and all trick shots are made by the special-effects department. In a dissolve, the scene you are entering is blended over the scene you are leaving. This may run from four to twenty feet, depending on the desired effect. The majority of dissolves are from four to six feet long. To illustrate: you might start with a full figure of Cinderella dressed in rags and dissolve over this her image dressed as a princess. There would be a few feet in which both figures are seen simultaneously, but the effect would be that of the princess emerging from the poor girl.

A wipe or wipe-off is a device used to shift action from one scene to another or from one location to another within the area of a single frame. For instance, a person may walk out of a scene, moving from left to right. In the next scene, he might enter a room far from the last. But he would be moving in the same direction, because the special-effects department would give the effect of the first scene wiping out from the left to the right and the second scene moving in in the same direction. If a person is going up in a building, the wipe would move from the bottom of the screen to the top, or vice versa if the person were coming down. There are many kinds of wipes, *fan wipes* and *angle wipes* being two of the most common. They are all made by using masks in front of the film. Any other trick shots would be made by the special-effects department.

We always have printed titles on film of whatever effect, such as a fade, wipe or dissolve, we wish to cut into the picture. These are temporarily spliced into the picture at the designated places on the film. At this point,

also, any *inserts,* which are objects used to symbolize a thought or idea to help express the story, such as letters, newspaper clippings, clocks, etc., are cut into the picture. When we feel that our working print is really right, and all effects have been made and inserted, we send the film to the laboratory where the negative is cut to match our working print. Now a new print is made from this negative, which we call the *feeler print.*

Now we are ready for the dubbing or re-recording. Here we add any sound effects which were not included when the scene was shot, either because we did not have those effects or it was better not to record them at the time. Music is also added at this point to whatever scenes are considered necessary. In some studios there are sound cutters, who do much of the work of assembling the various sound tracks. In other studios the editor does this work himself.

Perhaps a battle scene might best illustrate a difficult phase of dubbing, such as the Battle of Acre in *The Crusades.* When the scenes were originally made, only the dialogue and a few minor sounds were recorded. This track was then synchronized with the picture. Now the following sounds were added: the fire balls whizzing through the air and finally hitting some object or person, the creak of the heavy wooden war implements, the cries of the men when hit, the screams of the horses, the hiss of hot oil being poured down the walls, the sound of the arrows being shot and hitting, the sound of men's feet and horses stampeding, and music through the entire battle. Eight separate tracks were necessary for this re-recording. Each of these tracks is then taken to the sound department to a separate sound-recording machine or dummy.

In the dubbing or re-recording room a crew of about

four men or more work at a desk where the mixing is done. The editor, sometimes the director or producer, and the musical director assigned to the picture also work with the sound men. In this room the picture is projected on a screen and a sound horn conveys all these tracks simultaneously. The sound expert works his various mixing dials, increasing or subduing the sounds until a general agreement has been reached. This combination of tracks is now re-recorded on to a master track, which is the track that goes into the finished picture and is heard by the audience in the theater.

A simpler illustration of re-recording is shown in the musical comedy *This Way Please*. A roof garden and penthouse on top of a theater were featured in the picture. Some of the scenes were photographed on the roof of a building in Los Angeles, to give the feeling of height. All dialogue recorded in these scenes naturally included the traffic and street noises from below, and these could not be eliminated. A replica of this roof was subsequently built on the studio stage where the musical numbers were made, which could not possibly have been shot on the roof of the downtown building. When the picture was cut and ready for dubbing, the track containing the street and traffic noises was brought in. The songs and music could be given a much clearer recording by this method, and the downtown noises became secondary. Only three dubbing channels were needed for this mixing.

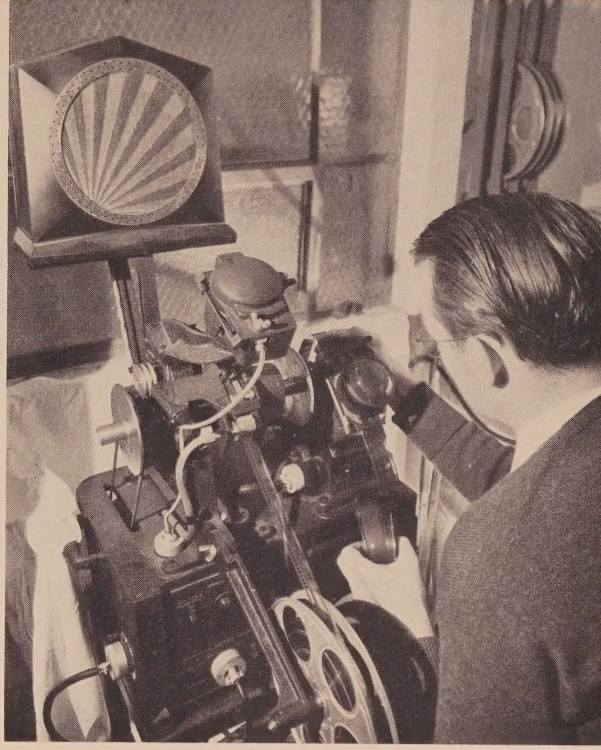
When the sound has been re-recorded on to the master track the negative is recut using the new track, and a print is made at the laboratory which is now ready to run at the theater for a preview. This is called the first preview print. Some of the executives and technical staff, including the cutter, go to the preview and watch the audience

reaction to see where the picture interests and where it drags, where the comedy is good and where it fails to get a laugh.

The average picture runs in length from about six thousand three hundred feet up to twelve thousand feet, which has been selected from a total footage of about a hundred thousand feet. A light comedy or drama might run about six thousand feet. The more dramatic or spectacular story or musical runs on an average of between nine thousand and ten thousand five hundred feet. Very few run higher. There are exceptions, of course. *The King of Kings* ran twelve thousand feet, *The Sign of the Cross* about eleven thousand. At a sneak preview we will show a picture which should run about six thousand feet in about seven thousand feet, and judge what to eliminate by the reaction of the audience.

After the preview a conference is called and the picture is discussed, with the audience reaction in mind, to see what eliminations should be made and how the weak points may be strengthened. Sometimes it is considered beneficial to retake some of the scenes, but that is only in extreme cases. If this is necessary, the cutter goes through the picture again and prepares it for a second preview. Few pictures are previewed more than twice. Occasionally, however, the producer may feel it necessary to have more than two previews, at entirely different locations, usually in small towns.

Eliminations after the preview may result in that phenomenon known as the "face on the cutting room floor." Sometimes a very good character actress or bit player may just happen to be in one or two sequences which need to be eliminated because they are not sufficiently interesting to include in the picture. Sometimes the perform-



A cutter runs the picture at right, and the sound track at left, through the Moviola. The round disc over the picture track is a magnifying lens. The sound comes through the loudspeaker above. (Courtesy of Metro-Goldwyn-Mayer Pictures.)

Two film cutters examining the sound track before splicing it.

ance of an actor or actress is very bad; then we use every possible method to cut him or her out of the scene. This can be done either by using close-ups of other characters in the scene or by using any shots in which the actor did not appear. Or we may try to cut out portions of the scenes which were bad. Our method depends entirely on how much material the director has given us. This makes me repeat that the director who *overshoots,* or takes more material than would seem necessary at the time, stands a better chance of having a good picture in the end.

Quite often we find that a sequence or scene is much too talky or too long for the phase of the story it should express. If the director has shot a number of different angles and individual close-ups for the scene, it is much easier to eliminate lines and words of a sentence from the sound track. If we want to cut on a close shot of a group of people, we can cut to a longer shot further down in the scene, and by this means we can drop whatever lines are superfluous. However, if the action has changed much in that interval, such a cut is bad, because it will not match the previous scene. For example, if one character has crossed to the other side of the room during the eliminated portion, the first scene of the whole group followed by the second will give the effect of a jump. If the director has provided us with close-ups of the different characters, we can cut to a close-up of a character either listening or reacting to a line spoken just ahead of the one we want to eliminate. In this case we can either jump our sound track to where we again start the dialogue, after the cut, or put a piece of silent track (which every cutter has on hand) over the close-up, and then, when we go back to our group shot, pick it up at whatever point we wish.

Sometimes we find that an actor has said one incorrect

word in a sentence, or that a line would sound much better if a word were changed. To remake the scene would be costly and take too much time. Instead we have the actor who spoke the line make a new recording with the changed word. This is called a *wild track*. Now we do not replace the entire sentence, because this would not synchronize with the scene. Instead we merely replace the word. It is now impossible to detect the change.

This became necessary in a scene from *The Plainsman*. A crowd of people were haranguing Calamity Jane, because they felt she had betrayed the soldiers' route to the Indians. One man spoke the line, "Only eight men out of forty came back." This scene was made before the battle. After the battle was shot, it was decided to have eighteen men survive instead of eight. To remake the scene with the crowd would have cost many thousands of dollars. So the actor who had spoken the line was called in, and he reread it as eighteen instead of eight. At first we thought we could merely add the "teen" to the original eight, but this was impossible, as the space on the track was limited. We finally cut the words "eight men" from the original track and replaced them with the word "eighteen," so that the line now read, "Only eighteen out of forty came back." In another instance I added the letter *s* to the end of a word which the actor had forgotten, because it changed the meaning of the sentence.

And now that the editor's job is over, he hopes that he has told the story as effectively as possible, within the framework of the script, so that the audience will be utterly unaware of his work. The story should flow smoothly and the various shots should match perfectly. Unusual angles should not be employed merely for their own interest, unless they are effective in telling the story. The

moment the audience is aware of the various cuts and devices used, the story will suffer.

We must reinterpret the material given us by the director so that the strips of film will assume a rhythmic flow. Our work is highly individual; no two editors work alike. We must rely on our instinct and previous experience to create the pattern. We must maintain the whole greater than the sum of its parts. If the film is poorly cut, the whole sense of the story is lost. If it is well cut, the effectiveness of the story will be considerably increased and it will possess a new unity which would otherwise exist in the director's mind alone.

XIV

SCORING THE FILM

Max Steiner

MUSIC has probably had the most hectic career, not excepting sound, of all mediums which combine to make a motion picture.

The present use of music in heightening the emotion of a film was borrowed directly from the elaborate orchestral accompaniment in motion-picture theaters during the silent days. No theater was too small to hire a regular orchestra. But with the advent of talking pictures, recorded music, both vocal and instrumental, was used sparingly at first, as was the dialogue. In some instances an entire picture would be silent, and suddenly in the fourth or fifth reel someone would burst into song, as in *The Pagan Love Song*. The theater orchestra still played the accompaniment up to the time the sound track was used, leading up to the particular key in which the song was being played. Then, as soon as the recorded music was over, the orchestra would start playing again, leading away from it gracefully.

A year or so prior to that time, the Vitaphone short subjects came into vogue. In these, a large orchestra of symphonic strength was assembled and photographed while recording the music. In some instances, close-ups of the players were shot, and vocalists added. These photo-

graphed orchestra novelties would then be shown instead of comedies, scenic subjects or cartoons.

The economic distress in which musicians found themselves after the advent of talking pictures was somewhat counteracted by a miniature gold rush to California. Well-known musicians and orchestra leaders were brought to Hollywood, and the march of recorded pictures began in earnest.

For reasons which I will later explain, there was very little underscoring (background music) in those days, but chiefly main and end titles (opening and closing music). Recorded music was deemed necessary only for musical productions, such as *Rio Rita, The Street Singer, The Rogue Song* and *Vagabond Lover.*

Almost insurmountable difficulties confronted musicians in those days in successfully transferring even a small part of the actual sound on to the sound track. The reasons were numerous: Producers and directors did not know how to handle music; sound men and musicians were inexperienced; the microphone was in its infancy; and, therefore, the entire technical staff went into contortions to reproduce, even in part, what was actually heard on the set.

I remember, during the filming of a certain picture, that it took us two days to find a suitable spot for the double bass, as the acoustical conditions on the stage were such that every time the bass player touched his instrument the sound track would *overshoot* (distort or blur). This experience with the entire company—actors, singers and musicians—on the set, cost the company seventy-five thousand dollars.

At that period the musicians were required to play very softly. The modern recording orchestra, however, plays

in a normal tone, and through the use of special microphones a great part of the orchestra balance is now maneuvered by the recordist.

In the old days one of the great problems was standard (actual) recording, as dubbing or re-recording was unknown at that time. It was necessary at all times to have the entire orchestra and vocalists on the set day and night. This was a huge expense when one considers that a musician was, and still is, paid thirty dollars for three, and fifty dollars for six, hours' recording, with half-pay for rehearsals. But because of inexperience and the very undeveloped technique of sound it was impossible to work fast. Many rehearsals and many recordings (takes) were necessary before a satisfactory result could be obtained. I have known of instances where one short number, of two or three minutes' duration, would take two days to record. As sound technique gradually improved, this loss of time was considerably lessened, until it became so far advanced that today a three-minute number can easily be recorded in one hour or less, if properly rehearsed and balanced (which, of course, must *still* be done carefully).

At this time, music for dramatic pictures was only used when it was actually required by the script. A constant fear prevailed among producers, directors and musicians, that they would be asked: Where does the music come from? Therefore they never used music unless it could be explained by the presence of a source like an orchestra, piano player, phonograph or radio, which was specified in the script.

To get back to musical pictures: The success of the early musicals like *Broadway Melody*, *Rio Rita*, *The Street Singer* and *The Rogue Song*, caused every company to concentrate on the production of this type of picture, and

fabulous salaries were paid to singers and musicians. It was prosperity at its peak for the chosen few; but, even as at present, the cycle of musicals was OVERPRODUCED. Through lack of sufficient good material and the ever changing taste of a fickle public, musical picture after musical picture failed, and the studios decided to call it a day and go back to dramatic pictures. It therefore became unnecessary to maintain a large staff of musicians, and so in September, 1930, I received a letter telling me that the studio would not require our services any longer and to dismiss everyone not under contract. In most instances the studios even tried to buy up existing contracts. Musical activity in Hollywood was almost at a standstill.

But in the spring of 1931, due to the rapid development of sound technique, producers and directors began to realize that an art which had existed for thousands of years could not be ruled out by "the stroke of a pen." They began to add a little music here and there to support love scenes or silent sequences. But they felt it necessary to explain the music pictorially. For example, if they wanted music for a street scene, an organ grinder was shown. It was easy to use music in night club, ballroom or theater scenes, as here the orchestras played a necessary part in the picture.

Many strange devices were used to introduce the music. For instance, a love scene might take place in the woods, and in order to justify the music thought necessary to accompany it, a wandering violinist would be brought in for no reason at all. Or, again, a shepherd would be seen herding his sheep and playing his flute, to the accompaniment of a fifty-piece symphony orchestra.

Half of this music was still recorded on the set, causing a great deal of inconvenience and expense. Whenever the

director, after the completion of his picture, made any changes, or recut his film, the score was usually ruined as it was obviously impossible to cut the sound track without harming the underlying continuity of the music. Occasionally we were able to make cuts that were not too noticeable.

At this time the process of re-recording was slowly being perfected, and we soon learned to score music *after* the completion of a picture. This had two advantages. It left the director free to cue his picture any way he pleased without hurting our work, and we were able to control the respective levels between dialogue and music, thereby clearing the dialogue.

To go back to 1931: With re-recording being rapidly improved, every studio again began to import conductors and musicians. At the time, I was general musical director for RKO Studios. I wrote *Symphony of Six Million,* and *Bird of Paradise* soon after, the first of which had about 40 per cent, and the latter 100 per cent musical scoring. Both pictures had been shot for music. The directors and producers wanted music to run throughout, and this gradual change of policy resulted in giving music its rightful chance. One-third to one-half of the success of these pictures was attributed to the extensive use of music.

After that many pictures were completely scored, one of which was *King Kong.* This score I wrote in two weeks and the music recording cost was around fifty thousand dollars. The picture was successful and the studio again attributed at least 25 per cent of its success to the music, which made the artificially animated animals more lifelike, the battle and pursuit scenes more vivid. After this other studios followed suit and began to score their pictures. At this time I wrote the music for *The Lost Patrol,*

directed by John Ford. Mr. Ford also directed *The Informer*, and he and I conferred on the use of music for this picture before it was shot. This was not the case with *The Lost Patrol*. At first it was not intended to have any music, but after the picture was finished the producer decided that, because of the long silent scenes, it was necessary to underscore the entire production.

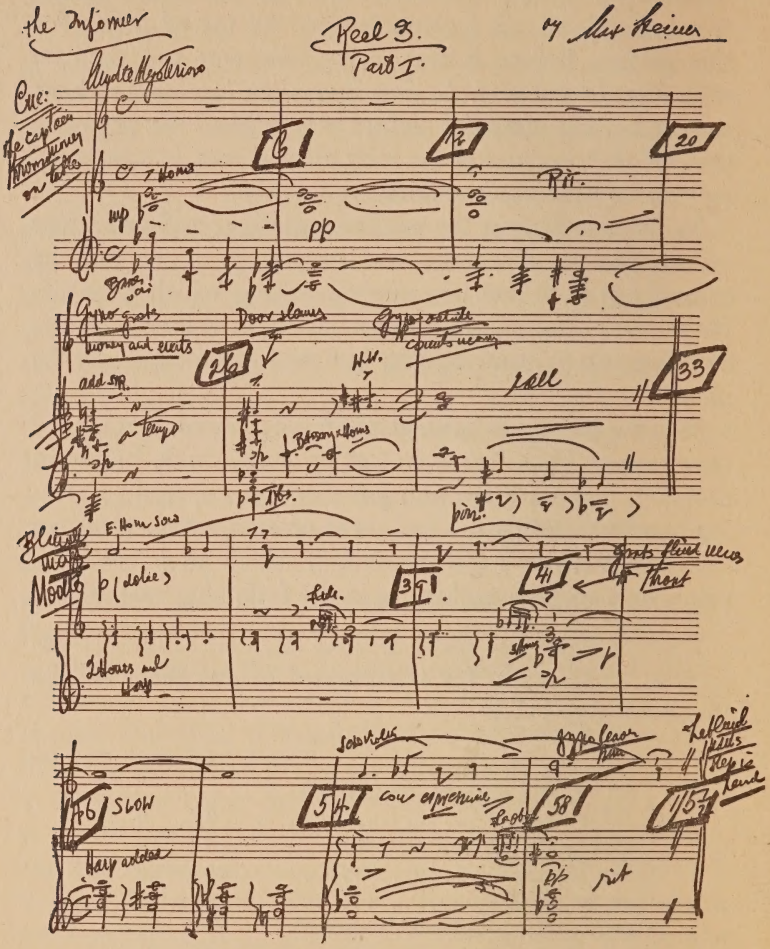
In order to explain the modern technique and procedure of composing, directing, and recording music for the screen, I will outline my way of scoring which may differ to some extent from the systems adopted by composers and directors in other studios: but the fundamentals are the same.

When a picture is finished and finally edited, it is turned over to me. Then I time it: not by stop watch, however, as many do. I have the film put through a special measuring machine and then a cue sheet created which gives me the exact time, to a split second, in which an action takes place, or a word is spoken, as in the following example:

Excerpt from cue sheet of Reel III, Part I, of *The Informer:* (The music for this excerpt of cue sheet will be found on page 222.)

		MIN.	SEC.	FEET	FRAMES
CUE:	The captain throws money on table		0	0	
1.	Gypo grabs money and exits		20	30	
2.	Door slams		26	39	
3.	CUT to blind man		33	49	5
4.	Gypo grabs blind man's throat		41	61	6
5.	Gypo leaves him		58	87	
6.	The blind man's step is heard	1	5½	97	7

By comparing the respective timing, the reader will be able to discern the method of underscoring. The music for



Cue sheet from *The Informer*.

The numbers enclosed by black lines represent the number of seconds for each cue. The cues are written in long hand above the music.

each cue is timed exactly by the number of feet and extra frames and by the number of minutes and seconds each cue runs.

While these cue sheets are being made, I begin to work on themes for the different characters and scenes, but without regard to the required timing. During this period I also digest what I have seen, and try to plan the music for this picture. There may be a scene that is played a shade too slowly which I might be able to quicken with a little animated music; or, to a scene that is too fast, I may be able to give a little more feeling by using slower music. Or perhaps the music can clarify a character's emotion, such as intense suffering, which is not demanded or fully revealed by a silent close-up, as, for instance, the scene in *The Charge of the Light Brigade*, where Errol Flynn forges the order sending six hundred to their death.

After my themes are set and my timing is completed, I begin to work. I run the picture reel by reel again, to refresh my memory. Then I put my stop watch on the piano, and try to compose the music that is necessary for the picture within the limits allowed by this timing. For instance: For fifteen seconds of soldiers marching, I may write martial music lasting fifteen seconds. Then the picture might cut to a scene at a railroad track, which lasts for six seconds, when I would change my music accordingly or let it end at the cut. Once all my themes are set I am apt to discard them and compose others, because frequently, after I have worked on a picture for a little while, my feeling towards it changes.

Having finally set my themes I begin the actual and tedious work of composing according to my cue sheets, endeavoring to help the mood and dramatic intent of the story as much as possible. The great difficulty lies in the

many *cuts* (sections; different locations) which make up a modern motion picture. For example: The first two minutes on my imaginary cue sheet consist of the arrival of a train in some little town. I would use music that conforms with the pounding of the locomotive, a train whistle or the screeching of the brakes, and perhaps some gay music to cover the greetings of people getting on and off the train. After these two minutes, the picture cuts directly to the death bed of the father in a little attic in an outlying farmhouse, the scene lasting three minutes in all. I must, therefore, devise some method of modulating quickly and smoothly from the gay music in the station to the silence and tragedy in the death room. These two scenes would consume five minutes of the ten-minute reel, and at the point of the father's death we might cut directly to a cabaret in New York where the daughter is singing, not knowing that her father is dead. Here is a transition which I would not modulate at all. Instead, it would be very effective to let a hot jazz band bang right in as soon as the cut, or *short fade,* to the cabaret was completed.

There is nothing more effective in motion-picture music than sudden changes of mood cleverly handled, providing, of course, they are consistent with the story. During this cabaret scene, while the jazz orchestra is playing, if the daughter is notified of her father's death, it would be absolutely wrong to change from the hot tune in progress to music appropriate to her mood. We must consider the jazz orchestra as actual music, not as underscoring; and, in order to make this sequence realistic, we should contrive to make the music as happy and noisy as possible. For, in the first place, the orchestra leader does not know what has happened, and would, therefore, have no reason to

change his music; and, second, no greater counterpoint has ever been found than gay music underlying a tragic scene, or vice versa. The latter, of course, applies only if the audience is aware of tragedy taking place unknown to the players.

Standard symphonic music, such as Beethoven's *Eroica*, should not be used in its entirety for the same reasons stated in my last paragraph. The change of locale and cutting back and forth make it almost impossible. For example, if I were to use a funeral march from the *Eroica*, however well it might fit the scene and mood, if the picture cut on the twelfth bar to a cabaret in the Bronx, what would I do with the funeral march by Beethoven? I would have to rewrite, discontinue or break it up in some way, and I, for one, am loath to recompose the old masters.

Furthermore, it is my conviction that familiar music, however popular, does not aid the underlying score of a dramatic picture. I believe that, while the American people are more musically minded than any other nation in the world, they are still not entirely familiar with all the old and new masters' works. I am, therefore, opposed to the use of thematic material that might cause an audience to wonder and whisper and try to recall the title of a particular composition, thereby missing the gist and significance of a whole scene which might be the key to the entire story. Of course there are many in our industry who disagree with my viewpoint.

In composing a score there are certain facts which I have found important to consider. For instance, it pays to watch the particular pitch in which a person talks. A high voice often becomes "muddy," with high-pitched musical accompaniment, and the same is true of the low pitch. I rarely combine these except when I want to attain a

special effect, such as matching voice and orchestra so that one is indistinguishable from the other.

The speed of the dialogue is also of great importance to the modern motion-picture composer. Fast music, over a slow dialogue scene, may help to speed up the action, but it may also ruin the mood, whereas slow music, over a slow scene, may either fit admirably or retard the action to an unprecedented extent. I rarely use fast music over fast dialogue. Instead I try to punctuate a fast-moving dramatic scene with music which seems to be slower, but which, in reality, approximates the same speed.

Pronounced high solo instruments or very low ones, or sharp or strident effects (oboe, piccolo, muted trumpets, screaming violins, xylophone, bells, high clarinets, and muted horns fortissimo) are taboo with me, because we should be able to hear the entire combination of instruments behind the average dialogue. But I have found muted strings, harp, celeste and low woodwind effects to be successful. Of course, there are exceptions to this rule, and in many of my pictures I have broken it entirely.

In fact, by now, the reader may well ask: What's the matter with Steiner? In one paragraph he gives advice and sets down a rigid rule, and in the next he reverses it. That is true . . . there are no rules, and there won't be as long as music continues to assume more and more importance in pictures, and the development of sound continues to make such rapid strides.

When the music has been composed and orchestrated, the orchestra assembles on a sound stage, especially treated for acoustics. The modern music-recording stage has soft and hard *flats* (panels) which can be moved around the stage on rollers at will to accommodate the different orchestral and vocal sounds produced. The reason for the flexibility of these flats is the varying sizes of orchestras

and choruses required to score a motion picture. Naturally, inside a theater an orchestra has a different tone quality than it would have out-of-doors; and, by the same token, a singer in a fairly small room would sound entirely different than the same singer in a large concert hall. In order to reproduce these tone qualities as closely as possible, these flats are moved around either to reduce or enlarge the size of the tone space required. Often these flats are not used at all, particularly when the orchestra or chorus is very large.

The monitor booth is usually located on the first floor, out of everyone's way. That is the room in which the recordist sits and manipulates the various dials (channels) which combine the different microphones and thereby produce the final orchestra sound track. This recordist, in most instances, is himself a former musician, or at least a person who has great interest in music. His work is tedious and of great responsibility, because of the enormous expense incurred during the recording of the picture, involving musicians' salaries and film expense.

If one considers that the orchestra may have to do ten to twenty takes of the same number in order to get one good recording, one can imagine the time involved, not to speak of the thousands of feet of film needed.

A good take can easily be spoiled by the noise of an overhead airplane. Many times mail planes pursuing their duty swoop a little too low over the recording stage during a very tender violin solo; and, of course, this recording cannot be used, as the most modern microphones are extraordinarily sensitive. Also accidents occur, such as the scraping of a chair, the dropping of a mute or a bow, or even the scraping of a shirt button on a stand, the swish of music sheets being turned over, or an unavoidable cough. It is not always a wrong note or a conductor's

mistake which causes a take to go wrong. Sometimes the projection machine *freezes* (gets out of order) and it may take fifteen or twenty minutes to repair. With a fifty-piece orchestra the expense is about two hundred and fifty dollars in unused salaries for this twenty-minute delay, as the musician gets paid from the time he is called until he leaves, whether he plays or not.

To get back to our first rehearsal of a new picture: The orchestra is rehearsed a little more thoroughly than other orchestras, for the better an orchestra plays, the less takes will be required and the less money spent on salaries and film. During this rehearsal the recordist places his microphones according to the wishes of the conductor, who indicates what instruments or orchestra sections shall be specially emphasized or *miked*. Then, when this is accomplished, while someone else conducts, the conductor goes upstairs to the booth to determine whether everything is to his liking. If it is, we then record our first take. Of course long association between recordists and conductors results in tremendous speed in balancing. I work with recordists whom I trust so implicitly that I rarely go up into the booth unless the recordist asks for advice, such as in the case of a special orchestral effect I wanted for the money theme in *The Informer*.

After our first take, we play it back. That means a loud speaker plays back the record that has been made on a separate recording machine, but which reproduces exactly the same result as on the film itself. It stands to reason that we cannot replay an undeveloped film; for, first of all, the negative would be spoiled, and, second, we would need a dark room for unloading, loading and re-winding. Should this playback be satisfactory, we go into our next sequence; rehearsal again, and we proceed exactly as be-

fore. We make as many takes as necessary until we get a perfect recording.

Each film is divided into sections of a thousand feet, and one such section is called a reel. A modern feature film consists of approximately nine to ten thousand feet. The latest projection machines in the theaters are able to run films of two thousand feet each, which are simply the first and second thousand-foot reel spliced together. However, the laboratories only develop thousand-foot reels. In recording music we divide a reel into as many sections as possible, for it is much easier for musicians and conductor to remember a two-minute scene than a ten-minute one.

In writing the music and recording it, great care must be taken by orchestra and conductor that the overlaps are properly handled, so that when the film is finally completed the listener is not conscious of the "breaks."

With our first day's recording over, we await the next morning with great expectation, or, shall I say . . . anxiety . . . when the laboratory sends the developed and printed recordings back to the studio for us to hear and pick takes. We sometimes print two or three recordings of the same number to be on the safe side, and in some instances intercut from one to the other. For instance, in a composition of one hundred and twenty bars' duration, the first ninety bars may be perfect whereas the last thirty may have been spoiled by any one of the aforementioned factors.

Our profession is not always "a bed of roses," and looks much easier to the layman than it really is. The work is hard and exacting, and when the dreaded "release date" is upon us, sleep is a thing unknown. I have had stretches of work for fifty-six consecutive hours without sleep, in order to complete a picture for the booking date. The

reason for this is the fact that the major film companies sell their pictures for a certain date before they have even been produced; and, if the film's final editing has been delayed through some unforeseen happening, the music and re-recording departments have to pitch in to make up for lost time.

After we have picked our developed takes which have been returned by the laboratory, and providing everything is satisfactory, these takes are turned over to the music cutter and he synchronizes them to the film and dialogue track. When these tracks have finally been set up the entire film is taken up to the re-recording room. There both dialogue and music are mixed and regulated; again numerous takes are made; and impurities of the film and sound tracks are ironed out. These re-recording sessions are every bit as tedious and painstaking as the original recordings, since they constitute the final product. The next day, when these re-recorded takes come back from the laboratory, the same procedure of picking the best takes is followed. This time, of course, more attention is paid to the ratio between dialogue, music and sound effects.

Then, some evening, the picture is given a *sneak* preview at some obscure theater, where only the highest executives are allowed to witness its initial showing. The studio management thereby wishes to prevent any unfavorable opinion from penetrating the papers before the final editing. Should the projection equipment have been in mediocre or very bad condition, the sound and music departments would be the butt of unfavorable criticism. Happily for us, all picture theaters, including the small neighborhood houses, are gradually buying or renting new first-class standard equipment. I think most of our troubles in that respect will be over in another year or so.

I have often been asked: What are the requirements that make for a competent film composer-conductor? I would answer: ability, good disposition, PATIENCE. A thousand and one things can happen to a music sound track from the time it leaves the composer's brain until it is heard by the audience. I have had pictures which did not require any music whatsoever, according to the producers. Some of these turned out to be 100 per cent underscoring jobs. On other pictures I was told that a certain film could not be released without an entire underscoring job, and I would work for weeks, day and night. When the finished product left the studio to go to the exchanges, only 60 per cent of all the music written remained. Many factors cause this: a bad preview reaction, very bad sound, the unfortunate presence of a director or producer, who might still be opposed to the use of music throughout, or dialogue that may have been recorded too softly at the outset, so that no music could be heard at the low level required to keep this dialogue intelligible.

In some instances a composer or musical director himself may feel that music did not help a particular scene. This is not always easy to recognize in the studio projection room because of the absence of any audience reaction. Besides, one who works close to a film is apt to get so used to the dialogue that he knows it by heart, and, therefore, does not miss any part of it during the multitude of runnings which are required to complete the job.

. . . . . .

Underscoring of musical pictures, apart from the actual performed songs, dances, or orchestral selections, is handled precisely like background music in dramatic pictures.

But as far as the songs or dances are concerned, musical directors in the industry follow different methods.

I will endeavor to explain my method of handling a musical picture by using as a specific illustration *The Gay Divorcee*, for which I directed, orchestrated and composed some of the music.

Unlike dramatic pictures, songs to be used in a musical picture must, of course, be composed either while the script is being written or immediately upon its completion. All songs that Fred Astaire and Ginger Rogers sang were recorded on the set with the entire crew present: director, cameramen, make-up experts, chorus girls, electricians, extras, etc., and some of them were accompanied by the orchestra I conducted—a very difficult procedure when one considers that because of the camera set-ups my orchestra and I were sometimes as far as a hundred feet away from the soloists. On a big stage where sound might have traveled at the rate of about ¾ sec., I had to be a little ahead of Mr. Astaire's taps, or voice, to offset this so-called sound lag. Singers often became uneasy because they could not see me, and because of the lag that they sensed due to the great distance between the orchestra and themselves.

Some of the songs were recorded with soft piano, i.e., a piano with a muffler on it, which was used to keep the principals in tempo and on pitch. This was to be covered later by the proper orchestra accompaniment, the conductor listening through earphones to both voice and soft piano. Naturally, with both the first and second channels working in perfect synchronization, it was possible to join the loud piano track obtained by this second channel to the voice and soft piano, thereby giving the conductor a

loud accompaniment, which was somewhat easier to follow.

By way of explanation: This sound microphone was placed so close to the soft piano's sounding-board that it naturally picked up only the sound of the piano, and could easily be eliminated when the orchestra accompaniment was recorded. This method is still in vogue and is used almost universally when either the set-ups during the filming of a song change frequently or when the director or dance director is shooting *off the cuff;* i.e., when it is impossible to determine in advance what is to be done with the song or how much of it is to be used when the tempo is so rubato that a pre-recording is out of the question.

Pre-recording means pre-scoring, pre-playing with an orchestra, piano, or whatever is required of the song or dance number to be used in the picture. This sound track is usually pre-recorded before the picture has even gone into production, and then re-recorded the same way as the soft piano would have been. What little sound has been picked up from these *low-loud* speakers (to which I shall hereafter refer as "horns"), if handled properly, should not be noticeable.

I have always insisted on my music cutter syncing (matching) these tracks by the modulations visible on the film and not by sync marks. This is because sometimes even that very faint morsel of tone that has seeped through gives the regular pre-played orchestra sound track a phonograph-like quality which is disturbing. However, if put in sync properly, this seems to disappear. For example: the singer sets his key with the musical director, and the routine is discussed with the director, or dance director; it is orchestrated and recorded on the proper music-

recording stage with the respective soloists present. But—he does not sing. Only the orchestra accompaniment is played, and I usually have the soloists go through the motions, or go up to the monitor booth and actually sing the song while I am playing it downstairs, simply to be sure that everything is satisfactory. It is obvious that were the performers to sing along with the orchestra on the same sound stage, the microphones would pick up the voices as well, and this would make the pre-recording track useless. This pre-scoring improvement was brought about through necessity. The soft piano and standard recording were cumbersome and unsatisfactory. A clever engineer invented a loud speaker that could be played so low that the new directional ribbon microphones could not pick up enough tone to spoil the track. These horns are placed as close as possible to the principals and they sing freely. The sound track can be stopped at will, and is played back either by special records (discs) to save time, or off the actual film on a special film playback machine. This low-loud speaker method has its points; but, like everything else in our world, it is not perfect. Any singer lacking excellent pitch is always in danger of singing flat or sharp, as the case may be, through his inability to hear the accompaniment distinctly. Also it seems rather hard to get an artist to give his best, and really let loose, with the music at a whisper when it should be lively and loud. However, I consider this method most advisable until something better turns up.

There is one other way which is used extensively in musical pictures of a more operatic character. Here the pre-scoring is done with singer, chorus and orchestra together. The singer then can sing with all the abandon necessary without fear of the camera and, in the case of

more serious music, I believe, this gives the best result.

When this kind of pre-scoring is used, the track is played back also by horns, but at full power. The picture is then photographed silently, the singer following his or her own voice as closely as possible.

In many instances the singer will again sing his or her part while being photographed, while taking care to imitate as closely as possible his or her original rendition.

With dancing the procedure is similar, but only necessary when the particular dance steps are audible, as in tap dancing, for example. This is also recorded by the low-loud speaker system, as in the case of Fred Astaire, because it later facilitates the clearing of the taps, and the lag between orchestra and dancer is likewise removed. This is unavoidable when standard recording is used. Sometimes, however, loud playbacks are utilized and the picture is shot silently just as in the aforementioned procedure when voices are to be recorded.

As to composition: It is similar to musical comedy procedure, or comic opera. There is no difference. For underscoring we naturally paraphrase the actual songs used in the picture, and try to mold them neatly together to avoid the intrusion of music as much as possible. It is amazing what can be done in putting together long dance routines, such as the "Carioca," "The Continental" and "The Piccolino." Each one of these dance routines was shot in short pieces, some of them not even eight bars long; then put together like a mosaic and freshly underscored, re-orchestrated, improved upon, then taps, sound, and vocal effects added.

A very important requisite is the *click* or tempo track. These click tracks, as they are commonly called, are used universally in cartoon series such as *Mickey Mouse*, *Silly*

Symphony, and *Looney Tunes*. These tempo tracks are filmed with every possible metronome tempo recorded on them. Conductor, orchestra and singer, while recording music for a cartoon, all wear earphones, usually only one, in order to leave one ear free to play on pitch. These tempo tracks even keep the players in exact time with the animation of the cartoon. These animations are drawn in frames to correspond with the exact bars of music to be used. I sometimes use this click track to guide me in long sequences, when the tempo is more or less unvarying, such as storm, train, racing, or battle sequences. Like the cartoon people, I simply decide on a tempo and then compute the frames into which the desired effects must enter, and write my music accordingly.

It might not be amiss to mention the music-clearing procedure. All music is divided into two classifications: copyrighted and public domain. Public domain means music of unknown origin, unknown authorship, or music on which the copyright has expired. Music on which the copyright is still enforced must be purchased either directly from the composer, or from his publisher. In order to facilitate this there is one central agency that has been set up in New York City, called the Music Publishers' Protective Association. This constitutes the clearing house for all music publishers and composers.

There are certain compositions that are not available at all, such as the Gilbert and Sullivan operas. Up to this writing the Gilbert and Sullivan Estates have absolutely refused to perform their works on the screen for reasons best known to themselves, and there are many composers of the same mind. Then there are highly restricted compositions, usually some number from a stage production which the producer, as co-owner of the copyright, is loath

to release for film use. He may still have hopes of being able to sell the entire "works" to some major film company, and, therefore, does not wish to break up the complete score.

Economic necessity is one of the principal reasons why a major picture company brings well-known composers out to Hollywood, as well as the desire to procure original music for new films. It stands to reason that if only published and copyrighted music were used, the cost of one hour's scoring would be prohibitive, as its usage must be paid for whether it lasts fifteen seconds or ten minutes. A circular inquiry was sent to all musical directors, asking for an opinion as to what time limit should be placed on one complete usage. Three minutes were suggested, and anything over this amount would constitute another usage. Therefore, should a number, song or orchestral selection, for instance, cost five hundred dollars for three minutes, three minutes and ten seconds would cost a thousand dollars. Because of this, almost all major picture concerns have direct affiliations with, or own, their own publishing house. The copyrights to the contract-composers' music are, of course, owned by the respective studios. An exception of prior rights is made and already listed by the American Society of Composers, Authors and Publishers, if the composer is a member.

The new wide range and ultra-violet recording has made it possible to reproduce faultlessly the entire range of the human voice from coloratura to basso profundo. Also, the orchestra range has been widened to such an extent that almost no limitations are placed upon the orchestrator or composer. (Very different from a few years ago when the low G on the double bass caused the most unpleasant consequences.) What is true of vocal reproduction is also

true of orchestral color. It is becoming more and more "high-fidelity" (true to life) every day. I agree with Mr. Leopold Stokowski that the ultimate perfection is in sight. More than that, I believe, as he does, that the recorded music of the future will be made to sound, both in volume and quality, far better than is conceivable today. I further believe that the limit of music in pictures has not been reached and that, finally, opera and the symphonic field will find their rightful place in this great medium.

Max Steiner rehearsing the orchestra on the recording stage. The switchboard (left foreground) starts the motors and the projection machines, which project the picture onto the screen (upper left). Left of the first violins are tuning bells to keep the orchestra in pitch. The librarian at the table keeps track of the "takes." In the background stands the recordist testing a large gong. Behind him are the "flats," both hard and soft. The movable curtains at the right are used for the same purpose. Over the orchestra may be seen three hanging microphones. (Courtesy of RKO-Radio Pictures.)

A scene is tested for color. The camera is grinding while an attendant holds various colored charts in front of Janet Gaynor and Andy Devine. (Courtesy of Selznick-International Pictures.)

The Technicolor camera is about to photograph a scene on location in "A Star is Born." The cameraman is just bringing the clap boards together to mark the synchronization between camera and sound. The large screen of black cheesecloth or "scrim" is used to diffuse the light on the players. Reflectors on the side give additional light. (Courtesy of Selznick-International Pictures.)

XV

DESIGNING FOR COLOR

Lansing C. Holden

WITH THE increasing advances which have been made in the development of color pictures, a new job has been created—that of the color designer. His function is to supervise the sets, costumes and properties; he must plot the color scheme as a whole and for each individual scene; he must assure the most dramatic and harmonious use of color in the same way that a musical director supervises the score of a motion picture. The recent technical advances in the production of color pictures have given the color designer a much wider scope in his use of this new means of expression. We know from the past that we cannot use color as the eye sees it, because the human eye grasps a larger radius than the lens of a camera. Besides, in a dark theater with a jet-black frame, colors are increased in contrast; this concentration makes them seem even brighter than they are.

Since colors which may seem natural to the eye often appear too brilliant and artificial when confined to a small screen, it is best to avoid colors which are too brilliant or harsh. The color designer should keep them subdued and soft in tone. In the early color pictures, the problem of recording colors was more important than their control. But now that the technical aspects have improved so

greatly, we can turn our attention to the use of color in enhancing the moods and dramatic structure of the motion picture.

In designing the sets and costumes there are certain considerations which the color designer must recognize. The one key color present in every scene is the color of the face of the actor. The background must be governed by this consideration. It should be kept a cool, neutral color so that it will retreat behind the face, which is always warm. If the background is a warm color, such as a red or orange, it will advance and interfere with the face, which is the center of interest. For the center of interest must be the center of color. In painting, a landscape of Corot's might lead the eye to a single spot of red on the bonnet of a peasant. But in a color picture, a single spot of color in the background or away from the center of interest would be disconcerting, particularly if it were out of focus. Nothing in the background should interfere with the dominating characters or the main action of the scene.

When the color designer receives his copy of the script, he must plot the entire color scheme for the production. He must study the script to ascertain the mood of each scene, and concentrate his color on the key character in each scene. He must consult with the art director on the color of the sets, with the costume designer on the color of the costumes, and with the cameraman on the lighting to be employed. He first makes sketches in color of the scenes in which a particular effect is required, so that everyone connected with the production will have an idea of what is needed. Then he makes tests called *material tests* of a number of drapes. It is important to test these for texture as well, because some materials absorb too

much light and others reflect too much. But these tests are hardly conclusive because a color photograph of a piece of cloth never gives the same effect as an actress wearing that cloth and walking through a scene. Besides, these tests are not taken under all the lighting conditions which will be used throughout the production.

Background tests are also made for the most important scenes. Samples of woodwork, doors, carpets and drapes must be photographed so that they will have the correct color value. Here the experience of the color designer should help him in discarding many samples which would not be suitable, so that testing can be cut down to a minimum.

In general, it is important to test the costumes of the principals, because the colors they wear will be the predominating or foreground colors. The backgrounds must consequently be designed to set off the costumes of the principals. The color designer must know what actors, bit players and extras will appear in a given scene. He must make sure that the costumes of the minor players do not conflict with each other and with those of the principals. In a costume picture, where the clothes are designed, selected and rented in advance, it is easier to control the color schemes. But in a modern setting, in which the extras provide their own clothes, the color director must continually be on the set to make last-minute changes in the wardrobe. Often he can plan the color combinations for one shot, but when the players present come in contact with others, he must consider the costumes of the others as well. For instance, if an actress appears in a blue dress in her most important scene and, similarly attired, she meets an actress in a purple dress in the next scene, the color designer must change the costume of the second actress to

avoid a clash, even if another color is less becoming than purple to the second actress.

There are certain hues, textures and kinds of material which when photographed on different actresses give a pleasing result. This is largely dependent on the individual coloring of the actress. But even if an actress looks well in a certain costume, this may not be suitable when reproduced by the camera in a particular scene and under particular lighting conditions. Co-operation between the cameraman and the color designer is therefore extremely important in a color picture. The designer must know the type of lighting used in every scene, so that he can discuss it with the cameraman. For example, if the script calls for a night scene in a dimly lit street, the principal should not be dressed in a dark green evening dress, because the cameraman would have difficulty in bringing her out in detail. She should have a costume which picks up low key lighting, such as silver lamé. But if this costume were used in a brightly lit ballroom, it would give off halations and pick up too much light to show to its full advantage. In other words, a given costume can be beautiful under certain lighting conditions, and it is the job of the color designer to plan so that the lighting and costumes will be effective for each scene and the backgrounds harmonious.

In designing the sets and costumes, he should try to fit the mood of the story and build towards a climax. In general, color may be used like music to heighten the emotional impact of a scene. If the entire scheme of a picture is restrained so that there is little color in the early scenes, which are played mostly in shadow, then even moderately bright colors will give the effect of great brilliance in the climax. This problem had to be solved in David O. Selznick's *A Star is Born,* in which in the early

scenes the costumes, sets, extras and bit players were designed in subdued colors, so that as the story of the young girl who wanted to become a movie actress moved from the North Dakota farmhouse to the rooming house in Hollywood, and then to her first screen test, the contrast between the low and high key scenes became more marked, and once her success was established, the color reached its highest level.

Another emotional use of color was the scene at the ball when the officers were suddenly called to war in *Becky Sharp*. Here the use of red lights on the officers helped to create the sense of impending doom. Color can undoubtedly be used to assist the mood of the story and to arouse emotion. But audiences should not be conscious of these various effects any more than they should be conscious of incidental music in a dramatic scene. The danger in using color for emotion is that it looks like a trick. It is not so much the colors that evoke certain emotions but the way in which they are used which determines their emotional effect. Of course other considerations enter into the designing of sets and costumes to fit the mood of the story. For instance, if a director or editor decides to juxtapose shots which were not planned in the original script, the designer has no recourse and the color mood may be lost. Or, if it is necessary for an actress to change her dress for the next scene, the color designer should be forewarned of last-minute changes so that the harmony will not be lost.

In color pictures today, the designer must make sure that every attribute of the picture, each costume and each set appear natural to the eye and give the observer the feeling that he is standing in the room pictured. In other words, color on the screen must match the scenes we see

in everyday life. We have accepted the convention of the black and white world of the screen, and now we must recondition ourselves to a closer approximation of our actual world. With this new tool comes a greater illusion of depth and of the third dimension. This is due to the fact that a cool color can recede, whereas a warm brilliant color can advance. The illusion of depth can be further obtained if a certain amount of color separation exists between objects as they recede into the background. In this way the recognition of one object behind another is obtained and the illusion of depth increased. However, the color designer can only try for this effect because the feeling may be destroyed by an entirely different camera set-up.

Scientists have been working on the idea of color photography ever since Sir Isaac Newton, in 1666, opened the field with his discovery of the solar spectrum. One of the first results was his theory of the three primary colors. In 1792, C. E. Wunsch established red, green and blue-violet as the three primary colors. We know that when a band of white light is passed through a prism it forms a band of various colors ranging from red through orange, yellow, green and blue through violet, known as the spectrum. Each color in the spectrum has a definite wave length. White light consists of a uniform mixture of waves of different lengths. These waves are affected by the prism so that they are extended in a band in which the shortest waves are at one end and the longest at the other.

An object is colored because it absorbs some part of white light. Since white light is composed of blue, green and red light, blue light is white minus green and red light, and a blue object is one which absorbs both red and green light and reflects the blue light. In the same way,

green is white minus red and blue light, and a green object is one which absorbs the red and blue and reflects the green light. And, similarly, a red object is white minus blue and green light, and a red object is one which absorbs both blue and green light and reflects the red light. The light absorbed by an object may be said to be complementary to that reflected by it, so that blue is complementary to red and green light, which is yellow; green is complementary to blue and red light, which is known as magenta; and red is complementary to blue and green light, known as blue-green or cyan.

In 1861 Clerk Maxwell showed that all colors may be formed by mixing light of the three primary colors in various proportions. He took three photographs, one through a red, one through a green and one through a blue solution. Then he made positives of these three negatives on lantern slides, which he projected one on top of another by three lanterns, each of which was projected through its original taking solution on to a screen. He thus obtained the original colored image, and any other desired color, by adjusting the separate beams. He found that added red and green beams of light produce yellow, added green and blue-violet produce blue-green, and all the colors together produce white. This was the basis for the additive method of photography, in which three negatives are made through three color filters, and from these, three positives are made and projected through filters similar to those through which the negatives were exposed. This method was the one first used in obtaining colored motion pictures.

One of the earliest additive methods was the persistence-of-vision-method, first suggested for motion pictures by H. Isensee in 1897. The basis of all motion-picture projec-

tion is the fact that a picture formed on the retina persists for a short time and, if a succeeding series of images is formed in a short time thereafter, the result will be a composite in which the individual movements can no longer be distinguished. This applies to color as well. If red is projected, followed by green, before the red has a chance to fade from the retina, the green is superimposed and the resultant color in the brain will be yellow. If blue-violet is added the same way, the result will be white. The disadvantages in this persistence-of-vision-method are: first, that the rapid succession of colored images causes some eyestrain, called *color-bombardment.* Second, under this method, it is impossible to get a perfect composite result. For example, if successive pictures were taken of a man raising his arm above his head, we would see him in red in one arm position, in green in another and in blue-violet in a third, so that we would have color fringes and the images would not be correctly registered.

Another additive method, the simultaneous projection method, was tried, in which three juxtaposed lenses, each filtered with one of the three primary colors, take and project the pictures. Here the film must travel three pictures at each exposure if the lenses are placed one above another, and if placed side by side triple-width film must be used. The excessive rate of speed of projection by the vertical lenses shortens the life of the film, because of severe strain. G. A. Smith in 1907 devised a system, known as Kinemacolor, in which alternating pictures were taken and projected through a rotating shutter with red and green sectors. This method was handicapped by color-bombardment and the necessity of having special registering devices to keep the pictures superimposed.

All these additive methods proved impractical because

they required special projection equipment in the theaters, and theater-owners felt there was not a sufficient quantity of color films to warrant the installation. Scientists consequently set about discovering some method which would eliminate special devices, and by means of which a color picture could be projected in the same way as a black and white movie. The subtractive method was the solution. In this the film is a complete color record in itself, and it has the added advantage of not cutting down the amount of projection light by using filters, as the three-color additive methods did. In the subtractive method, the operator can switch from color to black and white without appreciable loss of light and without special devices for registering or projection.

The most successful subtractive method to date is the Technicolor method, which was invented in 1914 by a firm of Boston engineers, Dr. Herbert Kalmus, Daniel Frost Comstock and W. B. Westcott. Their first experiments were with a two-color additive process, but they soon abandoned this in favor of a two-color subtractive method. In this, two gelatin reliefs, produced on thin celluloid, were glued together back to back and dyed in complementary colors. Douglas Fairbanks made *The Black Pirate* by this process in 1926. In 1928, the Technicolor engineers devised an *imbibition* process which consists of the transfer of the dye image from a gelatin relief or matrix to a gelatin film, and between 1929 and 1930 *On with the Show, Gold Diggers of Broadway, The Mysteries of the Wax Museum,* and many others were made.

But the two-color process was abandoned because it could not adequately reproduce the spectrum. In trying to compensate for blue, the missing primary, most colors were distorted and both red and green were exaggerated.

It was not until 1932 that the spectral colors could be finally reproduced.

In the Technicolor camera three negatives are exposed simultaneously through a single lens. This is accomplished by a beam splitter made of two prisms of optical glass with silver-sputtered faces which produce a partially reflecting mirror. By this means, part of the light reflects through an aperture at the left of the lens, and the remainder passes through the normal aperture. A single Super X panchromatic film is exposed through this aperture behind a green filter, transmitting green light. Through the left aperture is passed a standard bipack (two films with their emulsion surfaces in contact), the front film being sensitive to blue, and carrying a red-orange dye which absorbs the blue rays so that only the red rays are affected by the rear emulsion.

When the three negatives have been developed, each must be printed in its appropriate color and the three-color images must be assembled on a single strip of film, and superimposed on one another in exact register. The Technicolor camera uses the imbibition method of printing. The three gelatin reliefs or matrices are each dyed with their complementary colors. The dye is then transferred onto another film strip which receives their images one above the other and contains a faint key image in gray silver to aid in registration and definition. The sound track has also been printed on the same positive film in silver.

The Technicolor camera can now reproduce both the color and light and shade of the scene to be photographed. Of course, it cannot reproduce the range of sensitivity of the eye any more than painting can. The ratio of the eye's range from the brightest white to the darkest black is about one to thirty-two. The range of contrast in color

transparencies is twice as great, about one to sixty-four. Both painting and photography seek to reproduce a great range of visual contrasts by the more limited contrasts available. In general, it may be said that whatever cannot be painted cannot be photographed. For example, if a color designer visualized a brilliant shaft of light in a particular scene, that shaft of light could be made no more brilliant in a motion picture than if it were painted on canvas. For the photographer, like the artist, is working with pigments also. And if the artist could not achieve the brilliance of that shaft of light, then neither could the photographer.

The difficulties of the color designer are similar to those of the painter and the stage designer. The painter must also work with a limited range of contrasts, but he differs from the color designer in having an unlimited choice of composition and in not having to subordinate all color to the center of interest. The stage designer, on the other hand, works with light so that his selection of sets and costumes must be harmonious from many different angles beyond his control. He may add more light to a given color to intensify his effect, but the color photographer cannot do this because it would mean overexposure of that one color, which would begin to affect the other negatives as well. So the color designer must work within the limited range of color photography and face the fact that the composition of moving images is difficult to control.

The color designer uses all the theories of painting in the selection of colors and backgrounds for a motion picture. Once the painter has established the background, foreground and intermediate distances, he has established a static relationship between them which does not change. But those colors in the painting which were good in their intensities and relative areas may become very disturbing

when they move into a different composition, or into a series of different compositions, as in a motion picture. For instance, if the cameraman cuts to a close shot, the larger area of a particular color may not be as pleasing as in the long shot, where it occupied only a small area of the total picture.

The cameraman's problem is to try to achieve the necessary light levels with as few sources of illumination as possible. The most favorable type of lighting for Technicolor is the arc lamp, in preference to the incandescent tungsten lamp which is used for black and white photography. The arc lamp gives greater light in fewer units, much less heat, and a more correct balance of the blue and red rays. Formerly much greater lighting intensities were necessary and only a universal flat lighting could be used. The number of lights used to photograph *Becky Sharp* in 1935 would be cut down one-half today. Fewer and better sources of illumination produce shadows and proper modeling. While flat or soft lighting may occasionally give pleasing effects, it should not be used for color photography, which requires a more careful balancing of shadows than black and white photography, because in the shaded areas the color values change, and all shadow detail may be lost. It is easier to keep parts of the set in a low key by keeping light away from them than to illuminate parts with more light which have been painted dark. In exteriors, colors must be designed darker because there is so much more light to contend with. Here the difference between color and black and white is even greater because color can reproduce contrasts of sky, water, trees and foliage more effectively. The cameraman must be careful to schedule his shots so that the difference in color between morning and late afternoon shadows will not be too great.

Trick effects can be done just as effectively in color as in monochrome. Fades, lap dissolves and wipe-offs can all be made by duping all three negatives and preserving the proper balance of exposure and register. Process shots using a projection background have not yet been successfully done on a large scale, because of the necessity of greater illumination for the projection screen.

The chief problem in make-up for color pictures is to achieve a natural effect. Heavy orange grease paint, which photographs naturally in black and white, cannot be used in color. The most recent type of make-up retouches any imperfections of contour or texture which were exaggerated in the early color pictures. This is no heavier than an ordinary street make-up, but it improves the natural coloring of the actor.

The demand for verity in color is the most dominant factor in color photography today. Perhaps as color progresses and begins to enter into every motion picture, the time will come when the color designer will be able to experiment with other than purely naturalistic effects, such as those achieved by Renoir and Cézanne, for example. Then it may be possible to get away from a literal translation of life, and design masques and mystery stories with imaginative color schemes. The convention of monochrome is certainly unreal, yet it is accepted by every person who sees a motion picture. Why, then, cannot audiences accept new uses and combinations of color?

There is no doubt that color is here to stay, that it is as important an element in motion pictures as sound or music. How soon color will become all-prevalent we cannot predict; perhaps in another year, perhaps not before several years. That depends on the quality of the color productions, which in turn stimulate the audience's desire

for color. Audiences are becoming more and more accustomed to it through cartoons, shorts and the increasing number of color features; they will demand good color features, to supplant black and white pictures, in the same fashion that the talkies supplanted the silent films. As color becomes general, it will make people more conscious of their surroundings, and they will begin to see the color around them. In this way the production of artistic color movies will do more to raise the standard of taste throughout the world than the movies of today. This is a task which the color designers of the future must not handle lightly.

The production of color pictures has not yet reached the point where a color script is prepared at the same time as the dialogue. When that time comes the color designer will get the script at the same time as the art director, so that he can prepare the color while the sets are being designed. Then color will be written into the picture with the same care as dialogue. At present the production of color movies is being forced into the black and white mold, in the script, direction and cutting. But perhaps the time will come when a totally different technique will be evolved. We know, for instance, that if a color shot is well arranged it can be held longer on the screen than the same shot in black and white, which would become dull. There will be a place for artists and painters. Directors who have definite ideas about color will be able to express them and experiment with them. The field which color opens to the motion picture is immense. Perhaps through color this youngest of the arts will in time reach its fruition.

XVI

MICKEY MOUSE PRESENTS

Walt Disney

THE WORLD of the animated cartoon is the world of our imagination, a world in which the sun and the moon and the stars and every living thing obey our commands. We pluck a little character from our imagination, and if he becomes disobedient we liquidate him with an eraser. No dictator has power half so absolute. Our materials are anything which the brain can imagine and the hand can draw—all human experience: the real world and dream worlds, color, music, sound, and above all, motion. A fascinating business, but to explain it we must talk of registering pins and exposure sheets, frames and layouts, basic tempos and sweatbox sessions, acoustical beats and audio-frequency oscillators. It is all very technical and confusing to a layman. Often we spend an afternoon showing visitors how cartoons are made, and at the end they timidly inquire, "But what makes the little drawings move?"

Well, as a matter of fact, all motion on the screen is just an illusion. When a motion-picture camera shoots a scene, it breaks the action into a series of still photographs, showing progressive stages of that action. When these photographs are projected on the screen, at the rate of sixteen hundred a minute, the illusion of motion results. This is

because the eye-brain combination cannot register the images as fast as we can project them on a screen, so it overlaps them and the illusion of motion results. This persistence of vision was discovered by Peter Mark Roget in 1826. The same principle explains why our drawn figures seem to move. We make a series of drawings showing the progressive stages of an action. Then we photograph these on regulation motion-picture film and project them on a screen at standard speed. They seem to move for the same reason as the flip books of your childhood, when you thumbed the pages of a pad of drawings and the pages whisked from cover to cover: the persistence of vision.

In 1831 Joseph Antoine Plateau commercialized the idea by sketching fourteen drawings on a cylinder. When the cylinder revolved, the audience, looking through peep holes in the front disc, saw the drawings move in the rear disc. But it was not until 1906 that the first animated cartoon was made on motion-picture film by J. Stuart Blackton of Vitagraph. It was called *Humorous Phases of Funny Faces*. The audience laughed when they saw a dog jump through a hoop and a man blow smoke in a girl's face. They were delighted by the novelty and forgave the crudity. Today audiences are more sophisticated.

The greatest labor-saving device in cartoon history was invented by Earl Hurd. In 1914, he began tracing his moving characters on transparent sheets of celluloid or *cells*, as they are called, and superimposing these over watercolor backgrounds. Thus one background could be used for an entire scene as a single stage set. Before Hurd, the animator was forced to sketch the background on every drawing, and even in the early days it took three or four thousand drawings to make a cartoon picture.

This same Hurd process enables us to have several artists work on each drawing or frame of the motion picture. In a scene in which Mickey Mouse, Donald Duck and Pluto appear, our Mickey specialists draw only Mickey, our Duck expert draws only Donald Duck, and so on. These separate drawings are traced on several celluloids. When three or four, on which the individual characters have been drawn, are placed over each other and the background, the camera sees them as one drawing or frame. You can imagine how much this adds to the even quality of our cartoons when you understand that our Duck specialists are apt not to be so proficient when it comes to drawing Mickey or Pluto.

The early history of the animated cartoon was one of gradual but slow development. Many series thrived and died. All were unbelievably crude compared to present standards. As a form of art and entertainment, cartoons had no prestige. They were turned out with a minimum of time, money and thought. Distributors gave them away as premiums to exhibitors purchasing features. The average cost was around two or three thousand dollars. Today we sometimes spend eighty thousand dollars for a seven-minute picture.

There has been a great improvement in the mechanical end of production. In the old days before sound came into existence most of the cartoon equipment used was makeshift and crude. Gradually we have improved our cartoon technique by improved equipment, so that today the cartoon is steady and flickerless and the animators produce better and smoother action. But the main improvements have been in our understanding of the medium, better artists, drawing and story technique.

In making an animated cartoon the most important step

comes first—the selection of the story. If the story is good the picture may be good, but if the story is weak, good color, music and animation cannot save it. Most of the stories used in our productions are original, although we have a large library of children's books and reference books of the fantastic and imaginative type, and often refer to these for ideas including well-beloved folk tales, Mother Goose rhymes and children's songs. But our eight-minute adaptations must be quite different from the originals because it is impossible to tell such stories in eight minutes without drastic condensation and revision. Even in our first feature, *Snow White and the Seven Dwarfs*, the Grimm Brothers' version had to be considerably cut, although it was short story length and our film was to be ten reels. But without such cuts there would be no room for our own fantasy, comedy and characterization.

In our Mickey Mouse subjects we always build the picture around the characters; they are never changed to suit the picture. The characters here have definite personalities which we try to keep before the public, so that they will recognize the idiosyncrasies of each one. Therefore, our choice of stories for the Mickey pictures is more restricted than for the Silly Symphonies, where we are in the realm of complete fantasy.

Because of limited footage and because much of our seven hundred feet will be devoted to touches of fantasy, gags and personality business, the basic story idea must be simple. It can usually be told in one sentence. For example:

FLOWER BALLET: The life cycle of flowers told in ballet pantomime.

ON ICE: Mickey and his gang go skating.

CLOCK CLEANERS: Mickey and his gang clean a big clock in a steeple.

MOVING DAY: Mickey and his gang go through all the typical agonies of moving under pressure, when the sheriff evicts them.

DONALD AND PLUTO: Pluto swallows a magnet, which attracts everything metal in the house.

We aim to have our subjects appeal to the child in the adult. At the same time we try to inject action in the stories which will keep the children amused, if the subject matter is a little beyond their comprehension. It is necessary for our cartoons to appeal to the adult, since adults form the largest part of our audiences. It is interesting to note the difference between the reaction of a child audience and an adult audience to the same subject. The children laugh at entirely different things from those that amuse the adults. When possible, we try to find a happy medium which will appeal to both.

Story ideas come from all over the studio. They are never purchased from an outsider because too often he submits ideas identical with those which have already originated in the studio. The result may be a lawsuit, the writer believing he has been pirated or bringing suit because he has nothing to lose and possibly something to gain, if the jury is sympathetic.

A cartoon is made like any feature production. First, there is the story crew, consisting of two or three gag men and a continuity expert, who take a simple story idea and play with it for several weeks. If it is a gag picture built around a simple idea, then gags shape the story. For example, Mickey, Donald Duck and the Goof fix a big clock high up in the air. The gag men first make a list of the props, particularly mechanical props such as

the springs, cog wheels and pendulum of the clock. Then they examine the situations and atmosphere in which the characters will appear. Many of the gags are based on the principle of cause and effect mechanically solved. For instance, the Goof goes out on the scaffolding to dust a bell. Because it vibrates, he vibrates too. And as he stands helpless, the row of figures which come out when the hour strikes appears, and one of them hits him on the head. The story crew develops a mass of angles, gags, situations and personality business during this exploration period. Of these several are practical and sometimes brilliant. We discuss the ideas over and over until we finally have a definite outline. Then this is written in synopsis form, with suggestions of situations which may be elaborated on in the story. A copy of this outline is handed to the entire staff of the studio individually; they read it over in their spare time or at home, and illustrate with very rough sketches any further ideas they may have for the story. Two weeks later these are handed in to the story department. Often an idea results which changes the entire slant of the story. The story department goes over all this material and finally evolves a definite scenario or continuity, in which we try to incorporate all the good gags and suggestions which have been submitted by the staff. For the next few months the story will gradually assume its final form through a painful process of addition and elimination.

During this shaping period, the entire story department will be called in several times to discuss the story. Such meetings take place around a portable board (eight feet long and four feet high), on which are tacked rough sketches telling the main points of the story in sequence. Practically all of our story men are artists, not writers,

because in this work ideas must be presented visually rather than in words. They must be able to visualize how their ideas will look on the screen. The scenario is visualized by looking at the sketches from left to right, row after row. Frank criticism and drastic revision mark the spirit of these story meetings. As ideas are discarded, the sketches illustrating them are taken off the boards. Sometimes a melancholy story crew will carry away a board as blank and barren as an empty billboard.

The process of change and refinement continues. It takes from eight weeks to six months to shape a story for the director. At certain stages of the story's development, the director, his story supervisor and musical director are brought in, each of whom can contribute perspective and a fresh point of view. This is important because the story crew, working eight hours a day on one story for several months, usually loses perspective, a sense of values and the audience point of view.

Here are some of the common pitfalls our story men and directors should avoid, but sometimes do not.

Wish thinking: Hoping that a good 1,500-foot story will boil down to a good 700-foot story.

Losing perspective: After working on a story for months, we begin to think that new ideas look better than the old ones. And we see the story as a series of incidents rather than as a unified whole.

Forgetting the audience: Since the story is so familiar to us, we are apt to speed up action to the point at which audiences cannot clearly follow it. We rush past laugh spots without giving the audience time to laugh and fully appreciate the gags. We have too many things going on at once, so that the audience is confused, and we do not

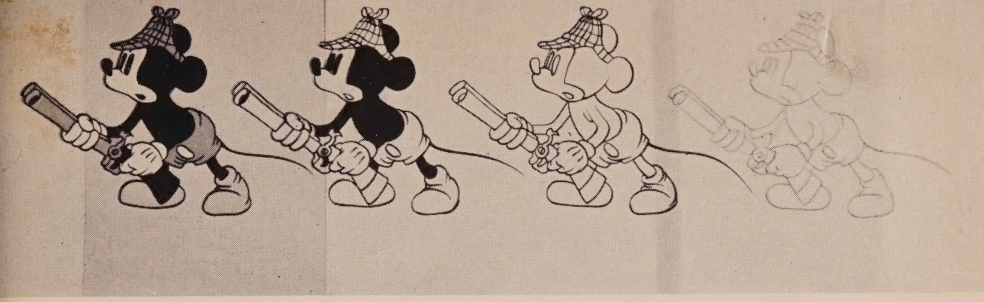
bother to make our story points clear and convincing because we ourselves understand them.

Pet ideas: An idea may be very funny but inappropriate to the story. It is very hard to eliminate such ideas, especially when they are your own. But our stories must move in a straight line.

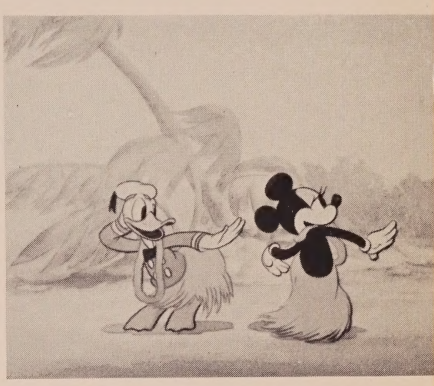
Subtlety: A subtle idea may be very intriguing, but is doomed to fail before an audience. All our business must be direct and obvious. Our technique has not yet reached the point at which we can successfully express subtleties through drawn action, and be sure of the result.

If, after several months, the story refuses to crystallize, it is either discarded or put aside until we can bring new ideas and a fresh perspective to bear on it. If we feel that the story is close to what we have in mind, it is transferred from the story department to a director and his story supervisor. The director is primarily an expert technician, versed in the mechanics of picture-making. His deficiencies as a story-teller, if he is so lacking, are made up by his story supervisor. In theory, the director and story supervisor complement each other's abilities to make a well-rounded supervisory unit.

Together the director and story supervisor begin to plan every detail of the picture, foot by foot, scene by scene. A lengthy process of refining, working out details and embroidering the rough structure with personality flashes begins. They may add bits of business, strengthen weak spots or even rebuild the whole story. The director now cuts the story down to the required footage, works out the entrances, exits, close-ups, dissolves and all other technical details. He determines how much footage each action shall be given, and with his musical director he roughs out



Progressive stages in drawing and painting a cell.



A painted cell showing Minnie Mouse and Donald Duck superimposed over a background cell.

Girls working on an animated cartoon, painting the cells.

the music and sound effects which will accompany the story.

At this time, also, he must record the dialogue so that it may be measured in terms of frames or single drawings. For instance, if the line "Hello, there!" takes one second to say, it will take twenty-four frames for the lip action to form the words, because film runs at the rate of twenty-four frames a second.

Now the stage sets or *backgrounds* are planned, and from these *layout sketches* are made which show the relation between the moving figures to the stage sets, scene by scene. These layout sketches guide both the animators and the background designers because they diagram the fields of action, thus showing the animator how far his characters can move, where all non-moving objects are located, and where other characters and moving objects appear in the picture. Similarly, the layout sketches, by diagramming the paths of action, show the designers of background department where to leave their water-color stage sets clear for action, and where to place each door, window or object which may have bearing on the action of the characters. In short, a layout sketch is the co-ordinating factor between animators and background designers.

By the time the director is ready to call in his animators, he has charted the entire story on a *layout sheet* or *bar work sheet*, which is his working script. This is a sheet of paper divided into rectangles, each of which represents a bar of music. In each rectangle are written the action, sound effects and dialogue which will occur while the bar of music is being played. This bar work sheet is also a guide for the musical director, who by now has roughly planned his score at a series of conferences with the di-

rector. In short, a director's work sheet contains the skeleton idea of the entire picture. It is a means of keeping the picture on paper without having to refer to each individual scene. It is a guide for the cutting department in determining the length of various scenes and sounds. It is, furthermore, a means of determining rough action footage before the animator starts his drawing so that the footage allotment on each scene will not be too high for the picture as a whole. It is a bird's-eye view of the whole production.

To guide the animators, the director must prepare another form—*the exposure sheet*. This is a very long piece of ruled paper, on which each line is numbered and represents a frame, which, when photographed, will be a single exposure on the motion-picture film. In a column on the left-hand side of the exposure sheet, the director or his assistant indicates the exact action of each frame. If the action is to be synchronized to music, as in a dance sequence, the exposure sheet will also indicate on which frames the musical beats will fall, as the animator must begin or end rhythmic movements on those beats. Likewise it will show the frames in which sound effects and dialogue will be heard, so that the action will synchronize with the sound.

The director now calls in his head animators and explains the action of the story in detail. Then he distributes the various scenes among them, if possible giving each animator the type of action at which he excels. There is specialization throughout our studio. Some animators excel at drawing Donald Duck or Mickey Mouse, some at making lip action fit the dialogue exactly, some excel at drawing real animals, others in humanizing them, and there are still others happiest in animating dance routines or a rip-

snorting chase. If the animator is a highly creative draftsman with a flare for characterization, the director will allow him considerable leeway in working out the details of the action.

If the animator is not creative, the story supervisor and director will work out his action in detail. He need only draw well and follow instructions. There are only about a dozen artists in the world today worthy of the name master animator. This is because he must be much more than a superb draftsman. He must know timing, showmanship and audience reaction. He must have the instincts and knowledge of a fine actor, because his characters act only as he makes them act; they are his own visualization of acting projected on the screen. And for the same reason, he must add the qualifications of a director.

To add to our roster of master animators, we scour the country for young artists and develop them in our training school. The future of animated pictures rests squarely on their shoulders. We will need an additional two hundred young artists every year for many years to come. But only a handful of these will develop into master animators. Of the remaining 99 per cent, some will remain as assistants to the master animators, others will become chief animators entrusted with scenes which do not demand the creative artistry and actorial ability of the master animator, while still other young artists will eventually gravitate to the background department or become layout men. The master animator is the king-pin, but the others are also necessary and important.

When he has received instructions from the director, the animator goes to work. He sketches in pencil on transparent drawing paper. At the bottom of each sheet of paper two holes are punctured, which fit over two register-

ing pegs in the drawing board. These keep his drawing paper in exact position at all times. In the center of his drawing board, and directly under his paper, is a pane of glass, lit from below by an electric light. After he has roughed out the first sketch, he does not remove it from the drawing board. Instead, he places a second sheet of transparent paper squarely on top of drawing number one, which shows through the second sheet and can be traced. He will trace drawing number two and all succeeding drawings of the particular action, and he will trace all but the parts of the character which are in motion. These moving parts must be drawn in a slightly advanced stage of the action on each succeeding drawing. It is these slight progressive changes which make the characters seem to move when projected on the screen. Obviously it saves much work to trace the immobile parts. Also it insures a uniform size and shape for the characters in every drawing.

Several animators may work on one character in a picture, using the model sheets to guide them. These are sketches of the character in numerous poses. As each animator has his own individual style of drawing and a slightly different conception of the character, model sheets are necessary so that, no matter who draws Mickey, he will always look the same. In making the feature-length picture, *Snow White and the Seven Dwarfs*, the animators used models of plasticine so that they could be sure their little human figures were as accurate as possible and so that they could see their characters from all angles.

The chief or master animator functions mainly as a teacher and supervisor. Under his guidance his assistants do most of the drawing. In a bit of action which takes twenty-four drawings to animate, the master animator will roughly sketch only the high points of the action: draw-

ings number one, eight, sixteen and twenty-four, let us say. His assistants will make the remaining ones and generally the actual finished drawings. The assistants' assistants, or apprentice animators, will do such easy work as cleaning up the rough sketches or drawing snowflakes or a flock of bees. Chief animators are scarce; we must spread their talent over as much of a picture as possible.

These first pencil drawings are called *roughs*. When an animator and his staff have finished a scene in the rough, it is photographed and projected on a screen in a small room called a *sweat-box*. Here the director, the story supervisor, the animators and myself run it through and criticize it, to analyze the lines of the animator and to make sure the action is correct. We make many changes, running it for hours and sometimes days until the action suits us. All unnecessary action or that which can be improved is eliminated, so that we finally have a skeleton of action for the picture and we know pretty much how it will look in its finished form. *Snow White and the Seven Dwarfs* was redrawn five times, for instance. Because of this insistence on quality, our animators average only three or four feet of action per day.

While the animators are drawing the characters in action, the background and effects departments are solving their particular problems. The term *effects* applies to such highly specialized work as animating moving shadows, moonlight and clouds, rain, snow and waterfalls. Backgrounds are painted in water colors on heavy drawing paper. Our background artists are generally craftsmen with wide experience in color, landscape, stage designing and lighting. They must know how the colors will look when photographed, for the Technicolor process does not always reproduce colors faithfully. Therefore, the background

artists must anticipate the Technicolor vagaries and compensate for them in advance. For example, if they want a strong red in a certain scene, they must use a weaker red in painting the background, because Technicolor exaggerates red.

The finished pencil drawings of the animators are sent to the inking and painting department to be traced in India ink on sheets of celluloid five one-thousandths of an inch thick. Only girls are employed in this department, as their temperaments seem best fitted to this very exacting type of work. Most of the girls have been trained in art schools. It is imperative for them to be able to draw a firm, true pen line because the most minute jiggle in a traced line or the slightest variation in its thickness will be magnified many hundreds of times when it is projected on the screen.

When the inking girls have traced the pencil drawings on the celluloids, each of which is numbered, another group of girls applies the color on the back cell. The paints are mixed in the laboratory of the department by girl technicians. The cells go through the painting department much as an automobile goes through an assembly plant. It takes one hundred girls about a week to ink and paint a short subject. After the cells have been photographed, they are washed in an acid bath which removes the ink and paint. They can then be used again two or three more times, until the surface becomes scratched.

Next the backgrounds and animation cells are assembled in the camera department. Our engineers have recently completed a multiplane camera, which gives the film a certain amount of depth. Cartoons have always appeared flat because a flat piece of celluloid was photographed over a two-dimensional background. This camera is far too

complex to be explained except by an engineer to engineers. But the basic principle is simple: The backgrounds and cells are spaced at a distance from each other. So when the camera photographs a frame of a cartoon, it is as though it were photographing a miniature set, in which there is actual distance between objects, just as there is a distance between the actor on a stage, the other actors in the scene and the backdrop. The next few years should see much improvement in our multiplane technique, as it is still in the trial and error stage of development.

Hollywood's cameramen grind away. Ours shoot one frame at a time. But both use motion-picture cameras. Our cameras are stationary and point down at the table on which the frames are assembled. The table has registering pegs. First the background is placed over the pegs. Then, four animation cells. If a frame has but three animation cells we add a blank cell in order to maintain a standard light density—the celluloids are not 100 per cent transparent, you see. In short, a frame is always four cells superimposed over a background.

Frame number one assembled, the cameraman pushes a button and the frame is photographed. He removes the cells and over the same background places four more cells to make frame number two. The scene completed, he takes another background and repeats the process. It takes about one hundred hours to shoot an eight-minute short subject by this laborious frame-by-frame, stop-action process. In live-action, the cameraman would shoot it in eight minutes.

The camera department now sends the film to the Technicolor laboratories where it is developed and printed by a secret process.

By this time the musical director has completed his

score. It will fit the action, as you remember, because the tempos were determined before animation began—each animator knew exactly on which frame the musical beat would fall. If, for example, the musical tempo were four beats a second, there would be six frames for each musical beat. This is because the standard projection speed for motion-picture film is twenty-four frames per second, and these basic tempos are necessarily multiples of the frame projection speed. In this instance, it would be twenty-four divided by four beats, or six frames per beat.

To synchronize the action of his characters to this beat, the animator need only begin and end each action on the frame on which the beat occurs. For example, if Mickey is running and the tempo is two beats per second, or a beat every twelfth frame, the animator will draw him so that his foot hits the ground every twelfth frame. The fastest tempo employed for cartoons is four beats per second; the slowest is one every twenty frames, or every five-sixths of a second.

Every orchestra director knows that he never plays the same piece of music twice in exactly the same length of time and that his beat does not always fall at the same instant. To achieve split-second exactness, our engineers have invented an electrical metronome, which is a complicated audio-frequency machine. This sends out impulses or beats with invariable exactness to the musical director and musicians, through their headphones. By following each beat, an orchestra can play the same tune a thousand times without varying more than a small fraction of a second.

We have a group of four men at the studio, most of whom have worked in radio, who specialize in sound effects and do research to be used in the future. We main-

tain a library of contraptions with which nearly every effect can be made, and these men know how to create whatever effects we need. For example, if we want the sound of a rainstorm, we can either use rain machines, or, if we want to exaggerate that sound, our sound-effects men will simulate rain with their mouths and musical instruments. If we wanted the sound of a giant chewing, we might use the actual sound of a rock crusher or we might simulate that sound by crushing a strawberry box or crunching a handful of gravel.

Caricature in any medium is the art of revealing the essence of an object or personality through exaggeration and emphasis. This is true of our sound caricatures. By exaggerating sound, we either caricature the sound itself or characterize the person or object making that sound. For example, the rhythmic phut-phut-pop-bang of an airplane engine warming up is a sound effect which provokes laughter through the exaggeration of the familiar carried to a ludicrous extreme. Although no airplane ever sounded like ours, the sounds accentuate the essential rhythms and noises of all airplane engines. Again, in *The Tortoise and the Hare*, the terrific speed of the hare was caricatured by a realistic sound effect. When the hare stopped suddenly in mid-flight, you heard the sound of screeching brakes. These were actually recorded at the traffic intersection in front of the studio. The same sound coming from a cartoon automobile would not have been as effective unless it had been heightened in pitch and volume to ridiculous extreme.

The sound effects, music and dialogue are recorded on separate sound tracks and then assembled on to a single track. The dialogue was recorded before the drawings were made, so that the lip action could be animated to fit

it. This was accomplished by having the animator speak the words before a mirror and then copy his own lip movements.

In the early days of Mickey Mouse, when the novelty of sound synchronized to action still amazed and delighted the audience, our characters romped through their pictures to a musical beat. But in the past few years we have used synchronization less and less. Personality business has replaced broad slapstick to a large degree. Acting to tempo looks artificial and unconvincing. Today, Mickey and his gang must act as well as move. However, in the Silly Symphonies, we are not confined to reality. Here, in the fantastic worlds of our imagination, all nature and her little creatures are governed by the laws of music and rhythm.

In the future, we will have more Silly Symphonies in which sheer fantasy unfolds to a musical pattern: this was the idea originally behind them. In the future we will make a larger number of dance-pattern symphonies. Action controlled by a musical pattern has great charm in the realm of unreality, but it is restricting when we attempt to create the illusion of reality.

Because of our growing mastery of technique, we will continue to emphasize comedy growing out of characterization and personality business, and minimize mechanical prop gags. It is probable that now and then we will take Mickey out of the barnyard and small-town atmosphere and cast him in highly imaginative and fantastic roles, or star him in well-known fairy stories and folk tales.

Short-subject length is a painful limitation in story material, whereas feature-length stories open a vast new realm for cartoons. We feel that entering the feature field will add greatly to the prestige of animated pictures. We see

no logical reason why an animated picture cannot hold the interest of an audience for ninety minutes.

In our feature-length pictures, we shall probably avoid dealing mainly with human characters. Let Hollywood handle those. We have a realm all our own, where little animals and even inanimate objects can talk and think and act like human beings, only more charmingly. While we have improved greatly in our handling of human figures, it will be many years before we can draw them as convincingly as we can animals. This is largely because the audience is infinitely more critical of drawn human characters. The audience knows exactly how a human character looks and acts, but is rather hazy regarding animals, and therefore accepts our caricatured interpretations of animals without reservation. Some day our medium will produce great artists capable of portraying all emotions through the human figure. But it will still be the art of caricature and not a mere imitation of great acting on stage or screen.

At the rate my young artists have grown in the mastery of their technique, it may not be many years before we will see great animated pictures. There is no question that animated pictures will have their geniuses. But always remember that, today, our medium judged as an art is young and immature and that our artists are young and immature. We are still feeling our way—learning through trial and error—but growing consistently in every department of our profession.

BIOGRAPHICAL NOTES ON THE CONTRIBUTORS

Note: The Academy of Motion Picture Arts and Sciences is an inter-studio organization for technical research and settling contract disputes. The Academy Awards mentioned here are given to individuals for excellence of performance in production and for scientific or technical achievement.

John Arnold: Born in New York City. Began his motion-picture career at the old Edison Studio; subsequently associated as cameraman with Biograph, Vitagraph, Kalem, Lubin, Essanay and many others. Then joined the Alco, which a few years later became Metro, later Metro-Goldwyn-Mayer. Photographed the first production four reels in length, the first commercial talking pictures fifteen years before Vitaphone, M-G-M's first two talkies, *The Broadway Melody of 1929* and *Hollywood Revue of 1929*, and the first American screen test of Greta Garbo. Became executive director of photography shortly after *Broadway Melody*. Probably his most famous single production is *The Big Parade*. Has invented the portable soundproof camera-housing or *blimp*, while camera-cranes and perambulators, automatic sound and picture synchronizing systems owe their origin in part or fully to him. Latest invention: a rotating windshield to protect camera lenses from spray in making rain scenes. Served as president of the American Society of Cinematographers (known as the A.S.C.) from 1932 to 1937 when he resigned. This is the professional and social organization of the world's best cameramen, includes the names of every director of photography of recognized standing here and abroad. The Society, founded in 1919, has been a leader in developing and proving new materials, equipment and methods, such an panchromatic film and incandescent lighting, and making these findings available to the camera profession. Publishes a monthly magazine, *The American Cinematographer*, devoted to professional and amateur cinematography.

Anne Bauchens: Born in St. Louis, Missouri. Started dramatics under Hugh Ford, the actor, but needed work, so became a telephone operator. After a year, worked in the advertising department of the *Post-Dispatch*. Came to New York hoping to go on the stage. Instead, worked for president of a real estate firm, later became secretary to William DeMille, who was then writing plays. His brother Cecil DeMille sent for him to help establish a scenario department in the original Lasky Company, and Anne Bauchens went also. When William

DeMille started to direct and cut his own pictures (all directors cut their pictures in those days), she went into the cutting room and became his assistant. Then through an emergency, cut her first picture, Cecil B. DeMille's *Joan the Woman.* Has worked for him since 1917, editing among others: *Male and Female, The Ten Commandments, Manslaughter, The King of Kings, The Sign of the Cross, Cleopatra, The Plainsman* and *Buccaneer.*

Clem Beauchamp: First entered pictures in 1922 as a *stunt man.* After a year was made assistant director, working on such productions as *The Hunchback of Notre Dame* and *The Ten Commandments.* Then joined Educational Studios as assistant director. During the course of five years there was writer, director and actor. Became unit manager and production manager at various studios. Won the Academy Award for assistant director with Paul Wing on *The Lives of a Bengal Lancer* in 1935. Joined RKO-Radio Pictures as assistant shorts producer in 1935.

John Cromwell: Born Toledo, Ohio, in 1888. Started stage career with Cleveland Stock Company, then went to New York and toured for three years with minor companies. Became actor and stage manager for William A. Brady for twelve years. In 1923, branched out on his own and produced and directed *Tarnish, Lucky Sam McCarver* and *The Silver Cord,* the latter two by Sidney Howard. Produced and directed *Women Go On For Ever* and *The Queen's Husband.* Directed and acted in *The Racket* in 1928 in Los Angeles. Went from there as feature player to Paramount, appearing in *The Dummy.* Then directed *Close Harmony, Burlesque, Dance of Life, Tom Sawyer, For the Defense, The Texan, Street of Chance* and *Scandal Sheet* in 1930; *Unfaithful, Vice Squad, Rich Man's Folly* and *World and the Flesh* in 1931. With Radio Pictures, co-directed *Hell's Highway* with Rowland Green. In 1933 directed *The Silver Cord, Double Harness, Ann Vickers;* in 1934, *Spitfire, This Man Is Mine* and *Of Human Bondage.* In 1935, *Jalna, Village Tale* and *I Dream Too Much.* In 1936, *Little Lord Fauntleroy* and *Banjo on My Knee,* and in 1937 *The Prisoner of Zenda.*

Bette Davis: Born Ruth Elizabeth Davis in Lowell, Massachusetts, on April 5, 1908. Educated at Newton High School and Cushing Academy. Played the lead in *Seventeen* and *The Charm School.* Went to New York to study dramatics; awarded the two scholarships given that year at the John Murray Anderson dramatic school. Played stock in George Cukor's stock company in Rochester, N. Y., and at Cape Cod Playhouse. Made her first dramatic appearance in New York in *The Earth Between,* appearing later with Blanche Yurka in Ibsen's *The Wild Duck,* then in *Broken Dishes,* and *Solid South* with Richard Bennett. Went to Hollywood, worked first for Universal Pictures, then Warner Brothers. Her first picture was with George Arliss in *The Man Who Played God.*

Then followed *The Rich Are Always With Us,* with Ruth Chatterton, and *The Cabin in the Cotton,* with Richard Barthelmess, after which she was given star billing. Some of the other pictures in which she has appeared are *Fog Over Frisco, Of Human Bondage, Bordertown, The Girl from Tenth Avenue, Front Page Woman, Special Agent, Dangerous,* for which she received the Actress' Award of the Academy of Motion Picture Arts and Sciences in 1935; *The Petrified Forest, The Golden Arrow, Marked Woman,* for which she won the Volpi Cup of the Fifth Annual International Exposition of Cinematic Arts in Venice. She has recently appeared in *That Certain Woman* and *It's Love I'm After.*

Walt Disney: Born in Chicago, Illinois, December 5, 1901. Studied cartooning at the Chicago Academy of Fine Arts at night, while attending high school. Joined the American Red Cross as an ambulance driver in 1918, went to France for one year. In 1919, returned and went to work for the Gray Advertising Company of Kansas City, then designed letterheads and theatrical ads, later did animated advertising films for the K.C. Slide Company. Experimented in his spare time, made a reel of about two hundred feet of local incidents in Kansas City. Then had the idea of animating old fairy tales in cartoon-length. Enlarged his studio, worked with a group of artists for six months on *Red Riding Hood.* Then made a series of Alice cartoons, followed by Oswald the Rabbit. The first Mickey Mouse was made in his garage, inspired by the tame mice he had caught in his office in Kansas City. The second was made at the time of Al Jolson's *The Jazz Singer.* Disney wanted to synchronize his cartoons, so in 1928 he made the first synchronized cartoon, *Steamboat Willie,* and soon afterwards the first Silly Symphony, built entirely on a musical idea without a central character. He added color to cartoons in 1932 in *Flowers and Trees,* prestige in *The Three Little Pigs* in 1933, an illusion of depth in *The Old Mill* in 1937, by using a multiplane camera, and in the same year he produced the first feature-length cartoon, *Snow White and the Seven Dwarfs.* For the last six years he has won the Academy Award for cartoons; in 1932 for *Flowers and Trees,* in 1933 for *The Three Little Pigs,* in 1934 for *The Tortoise and the Hare,* in 1935 for *Three Orphan Kittens,* in 1936 for *The Country Cousin.*

Hans Dreier: Born in Bremen, Germany. Graduated from the University of Munich. Was supervising architect for the German colony of Cameroons in West Africa for three years. Returned to Berlin where he became art director for the UFA studios between 1919 and 1923, working with Ernst Lubitsch on two pictures of Emil Jannings: *Danton* and *Peter the Great.* Since 1923 has been with Paramount here as art director for Lubitsch productions, such as *The Patriot, The Love Parade, The Smiling Lieutenant, Trouble in Paradise, Design for Living.* Was art director also for *Morocco, Shanghai Express* and *The Scarlet*

Empress. Since 1931, he has been in charge of the art department at Paramount Pictures.

PHIL FRIEDMAN: Born in New York City. Educated at City College and New York University Law School. Was an agent for several years, then went to Universal Pictures where he became head of the casting department. Then went to Fox in the same capacity; later resigned when Fox merged with Twentieth Century Pictures, and became executive assistant to Jesse L. Lasky at the Pickford-Lasky Studio. After this organization disbanded, Friedman came to RKO-Radio Pictures, where he has since had charge of stock talent and casting.

LANSING C. HOLDEN: Born in New York City in 1896, the son of an architect. Educated at the Hill school in Pottstown. Entered Princeton in 1915. When the war broke out, joined the air service, receiving the Legion of Honor, Croix de Guerre with palm, and Paz Marocain, the highest honors of the United States, France and Spain. Returned to Princeton, graduating in 1919, then took a Master of Architecture degree at Harvard. Went to Paris from there to the *Ecole des Beaux-Arts*. While there, joined the French air service in Morocco during the Riff revolt, then Professor Howard Crosby Butler's archaeological expedition to Sardia in Asia Minor. Returned to New York in 1926, entered the office of architect B. W. Morris as designer, at the same time wrote and illustrated articles for architectural magazines, did etching and lithographing and illustrated several travel books. Opened his own office as architect in 1930, but soon afterwards came to Hollywood at the request of Merian C. Cooper, at that time executive producer at RKO, who wanted him to be technical director for the flying sequences in a war picture. Holden collaborated on two scenarios, sold an original story, acted, flew and became a unit art director at M-G-M. Co-directed H. Rider Haggard's *She* with Irving Pichel. Designed the color of *The Garden of Allah* and *A Star Is Born* for Selznick-International Pictures.

SIDNEY HOWARD: Born in Oakland, California, in 1891. Attended the University of California, graduating in 1915. Next year he studied drama under Professor Baker in the "47 Workshop." Went to France during the war, drove an ambulance and became captain in the Aviation Service. In 1919 joined the editorial staff of *Life*. His first two plays, the *Labor Spy* and *Swords*, were published in 1921. The next year he returned to *Life* as literary editor. In 1923 published *Casanova*, an adaptation from the Spanish of de Azertis. His play, *They Knew What They Wanted*, was produced by the Theatre Guild in 1924 and won the Pulitzer Prize for that year. In 1925, he wrote *Bewitched*, in collaboration with Edward Sheldon, and *Lucky Sam McCarver*. In 1926-27, the Theatre Guild produced his *Ned McCobb's Daughter* and *The Silver Cord*. In 1930 he wrote *Half Gods*, *Alien Corn* in 1932, and in 1934 *Yellow Jack* in collaboration with Paul de Kruif, which was

produced by the Guild. He has written several adaptations, among them *The Late Christopher Bean.* In 1935 he collaborated with Sinclair Lewis on a dramatization of *Dodsworth* and in 1937 he wrote *The Ghost of Yankee Doodle,* which was produced by the Theatre Guild. Among the screen adaptations he has made are *Bulldog Drummond, Condemned, Raffles, Arrowsmith, Dodsworth* and *It Can't Happen Here* from the novels of Sinclair Lewis, and *Gone With the Wind.*

Jesse L. Lasky: Born in San Francisco, California, 1880. Was one of first hundred from the West Coast to go to Nome, Alaska, for the earliest gold rush. After a brief experience as reporter on a San Francisco newspaper, became a leader of the Royal Hawaiian Band of Honolulu, later teaming with the late Henty R. Harris in a series of musical acts in vaudeville. In 1914, organized and became president of the Jesse L. Lasky Feature Play Company with Sam Goldwyn and Cecil B. DeMille, producing several of the famous Belasco dramas: *Rose of the Rancho, The Girl of the Golden West* and *The Warrens of Virginia.* In 1916, the Famous Players Film Company and the Jesse L. Lasky Feature Play Company combined. Lasky was made first vice-president of the new corporation, and for sixteen years he was vice-president in charge of all production for the Paramount Publix Corporation. During this time he made *The Covered Wagon, Wings* and *Beau Geste.* He was the first to bring English authors and producers to Hollywood, the first to buy and produce the James M. Barrie plays for the screen: *Peter Pan, What Every Woman Knows* and *A Kiss for Cinderella.* In 1932, he resigned to form the Jesse L. Lasky Productions. During the next three years, he produced *Berkeley Square, Zoo in Budapest, As Husbands Go, The White Parade* and *Springtime for Henry, The Warrior's Husband* and *The Power and the Glory,* followed by *The Gay Deception* and *Here's to Romance.* With Mary Pickford he formed the Pickford-Lasky Corporation, producing *One Rainy Afternoon* and *The Gay Desperado.* After disbanding the Pickford-Lasky Corporation, Lasky joined RKO-Radio Pictures as associate producer.

Robert Edward Lee: Born in Charlottesville, Virginia. Educated in New York City, then studied engineering at Tome Institute, Port Deposit, Maryland. Began his motion-picture career as a property boy, and became an assistant director a year later. Left Paramount in 1916 to enlist in the army, becoming the first star on the Paramount Service Flag. In 1919, Lee returned to Paramount, then went to Europe for four years, where he directed and appeared in several films. Returned to Paramount and became assistant to Herbert Brenon. Lee has been assistant director to almost every important European director from Mauritz Stiller to Fritz Lang and Rouben Mamoulian.

Nathan Levinson: Born in New York in 1888. First worked as a telegraph operator, later became an electric and radio engineer. During the

war, he was made a major in the Signal Corps of the United States Army and was the commanding officer of the Signal Corps in the Radio Laboratory at Camp Alfred Vail, New Jersey. Joined the Western Electric Company as a Pacific coast radio specialist, then became managing director of radio station KPO in San Francisco, later the Western division manager of the Vitaphone Corporation of Electrical Research Products. He was the first man to interest Warner Brothers in sound pictures and his persuasion in introducing sound was finally successful. Since then he has been director of recording at Warner Brothers-First National Studio. In 1936, he received honorable mention for sound recording in the awards for scientific or technical achievement given by the Academy of Motion Picture Arts and Sciences. This award was made for the method of intercutting variable density and variable area sound tracks to secure increased volume range in sound recording. Major Levinson expresses his thanks to Dr. B. F. Miller and Mr. Lloyd Goldsmith of Warner Brothers Studio for the major portion of the preparation for his article on "Recording and Re-recording."

Samuel Marx: Born in New York City in 1902. Educated at Hamilton Institute for Boys and Columbia University. First job was in the export department of the Universal Film Company. When the secretary to the president, Irving Thalberg, became general manager of Universal's west coast studio, Marx went to Hollywood and became for a short time assistant director to Jack Conway. Returned to New York, worked first for a theatrical paper, then for some New York dailies. Was editor of *New York Amusements* for three years. Thalberg persuaded him to return to Hollywood, where he became editor of the scenario department at Metro-Goldwyn-Mayer, remaining there for seven years. While there, he wrote an original play, *Night Mayor,* which was produced by Columbia Pictures, and *Society Doctor,* produced by Metro-Goldwyn-Mayer, introducing the actor Robert Taylor. After Irving Thalberg's death, he became story editor for Samuel Goldwyn, which he has been ever since.

Paul Muni: Born in Lemberg, Austria (now Poland, Lwow), in 1895. Until age of four and a half, traveled with his parents who were itinerant actors. In 1900, went to London, where he started kindergarten, then to the United States in 1902, where he went to public school in New York. Five years later, the family moved to Cleveland, where Muni gave up violin which he had been studying for seven years, and joined his father's small group of actors in a vaudeville sketch company. In 1909 he went to Chicago as a full-fledged actor, playing character parts. When his father died, he became an independent actor at the age of fourteen, joining various companies and touring the Middle West. In 1918, he joined the Yiddish Art Theatre where he stayed until 1926. In the same year, he appeared in his first English play, *We Americans,* followed by *Four Walls* in 1927. Came to Hollywood and acted in *The*

Valiant in 1928 and *Seven Faces* in 1929. In 1930, returned to the New York stage in *This One Man* and *Rock Me, Julie*. At the end of 1930 he returned to Hollywood and made *Scarface*, then came back to Broadway for the season of 1931-32 in *Counselor at Law*. Then back to Hollywood for *I Am a Fugitive from a Chain Gang*. To New York for the return engagement of *Counselor at Law*, then back to Hollywood, where he made *The World Changes, Hi, Nellie, Bordertown, Black Fury, Doctor Socrates* and *Pasteur*, for which he won the Actor's Award of the Academy of Motion Picture Arts and Sciences and the Volpi Cup at the Fourth Annual International Exposition of Cinematic Arts Awards in 1936. Subsequently has made *The Good Earth, The Woman I Love* and *The Life of Emile Zola*.

Nancy Naumburg: Born in New York City, 1911. Studied dramatic production under Professor Hallie Flanagan of the Vassar Experimental Theater, graduated from Vassar in 1932. Upon graduation, tested audience reactions for RKO. Motion-picture and still photographer since 1934. Photographed and co-directed *Sheriffed* in 1934 and *Taxi* in 1935. Made a series of photographs of the tunnel disaster in Gauley Bridge, West Virginia, and of architecture and interiors in the Virgin Islands in 1936. Member of the National Board of Review since 1934.

Maximilian Raoul Steiner: Born in Vienna, Austria. Studied at the Imperial Academy of Music, winning the Gold Medal there. At fourteen, wrote and conducted his first operetta, *Beautiful Greek Girl*, which was produced at the Orpheum Theatre in Vienna. In 1904 went to England where he conducted at the Daly and Adelphi Theatres, the Hippodrome, London Opera House, the Blackpool Winter Garden and the London Pavilion. Then to Paris as musical conductor of the Alhambra Theatre, where he remained for one year. In 1914 he came to America and conducted and orchestrated musical comedies, revues and comic operas. In 1929 became general musical director, conductor and composer of Radio Pictures, remaining until 1936 when he became affiliated with Selznick-International Pictures. At present he is conductor-composer at Warner Brothers Studio. He has scored *Symphony of Six Million, Cimarron, Bird of Paradise, Morning Glory, King Kong, The Lost Patrol, Little Women, The Informer, Little Lord Fauntleroy, The Garden of Allah, The Charge of the Light Brigade, Green Light, A Star Is Born, The Life of Emile Zola* and *That Certain Woman*. Conducted and orchestrated music in *Flying Down to Rio, The Gay Divorcée, Roberta, Top Hat* and *Follow the Fleet*. In 1935 he received the Bronze Medal from King Leopold of Belgium at the Cinema Exposition in Brussels, and in the same year he received the Academy Award for the score of *The Informer*. He has been decorated Officier de l'Instruction Publique by the French Government. At present he is working on a symphony which he hopes to finish by the end of the year.

GLOSSARY OF TERMS

Arc lamp: An incandescent lamp of highest intensity formed by the bow of flame between two adjacent electrodes, emitting light approximating daylight.

B picture: A motion picture which is made on a limited budget with a short shooting schedule and uses the studio's feature players and minor contract players as acting talent. Also known as a program picture, it is generally shown as the second half of a double feature program.

Background music: The musical score used behind the dialogue in a motion picture.

Best boy: Assistant to the gaffer.

Bit player: An actor engaged by the day to speak lines at a minimum salary of $25.

Boom: Huge crane which lifts the camera and cameramen twenty to thirty feet in the air, permitting the camera a wide range in swooping around the set.

Boom shot: A shot taken when the camera is used on the boom.

Booster light: A light used in filming outdoor scenes to illuminate the shadows on the players' faces.

Breakdown: The analysis of the script by the unit manager and assistant director into a short synopsis of each scene, set, sequence, cast, wardrobe and the amount of time allotted for each set or location.

Broadside or broad: A box-shaped reflector housing two 1,000-watt globes side by side, which spreads light in an even flood over an angle of approximately 60 degrees.

Cell: A transparent sheet of celluloid upon which each separate figure is drawn in making an animated cartoon.

Channel: The equipment necessary for a single sound recording, which includes microphones, amplifiers, mixer panels and recording machines.

Choice: The selection of the best takes of both picture and sound by the director and producer.

Clapper: Or clapboard, two hinged strips of wood which are struck together by the assistant cameraman before a take, and are registered on both film and sound track to insure synchronization.

Close shot: A shot taken at close range for emphasis which includes a portion of the background.

Close-up: A shot taken at close range, which includes only the object or person photographed.

Console: The electrical re-recording device through which the mixer controls the volume of the tracks which are simultaneously re-recorded.

Continuity: A detailed scenario with a complete description of each scene.

Cut: To proceed from one scene to the next in continuity, used in photographing or editing a scene.

Daily (or dailies): The scenes taken on the previous day on the set, which are viewed by the director, producer and often the principal players on the following evening.

Dissolve: The gradual emergence of one scene from another on the film. In a lap-dissolve, the fade-in of one scene is superimposed over the fade-out of the other.

Dolly: A four-wheel camera platform to facilitate the camera's motion about the set, as in a trucking shot.

Dolly shot: A shot taken when the camera is mounted upon a dolly.

Double: An anonymous actor who substitutes for a principal in difficult feats or, when that actor cannot be present, is generally photographed in a long shot.

Dubbing: To substitute another sound track for the original; also synonymous with re-recording.

Dupe: A duplicate negative made by printing from a positive film or by printing from a negative and reversing.

Edit: To select and assemble the scenes in continuity, thereby telling the screen story as effectively as possible.

Extra: A player hired by the day who is not required to speak lines, and whose salary varies from $5.50 to $16.50, depending on his physical appearance and wardrobe.

Fade-in: The gradual appearance of the screen image from total darkness to its full visibility. Used to denote the beginning of a sequence.

Fade-out: The gradual disappearance of the screen image from its full brilliance to total darkness. Used to denote the end of a sequence.

Feature player: An actor or actress contracted by the studio for a week at the minimum.

Feeler print: The print made from the edited negative of the work print after all effects have been inserted, but before the picture has been re-recorded.

Flange: A small metal cylinder which is slit on one side to permit the film to enter and be held in place.

Flat: A section of painted canvas or thin board used in the construction of motion-picture sets; an acoustic flat is a movable panel on rollers used on the music-recording stage in controlling the various orchestral and vocal sounds to be reproduced.

Follow-focus: An electrical device for changing the focus when the camera moves toward an object.

Frame: Single image on motion-picture film.

Gaffer: The chief electrician.

Gobo: A black adjustable screen used to keep the rays of light from the camera.

Grip: Studio equivalent of the stage hand in the theater.

Heavy: A villain.

Juicer: An electrician on a movie set.

Leader: A piece of blank film attached to the beginning of a reel of film.

Location: A place other than the studio selected for filming scenes.

Long shot: An establishing shot taken from a distance sufficient to include a complete view of the scene.

Medium shot: A shot taken from a middle distance, or from knee level to above the head of a person.

Microphone (Mike): An instrument receptive to sound waves which transmits them to sound-recording devices.

Microphone boom: An adjustable crane which suspends the microphone.

Mixer: Sound man responsible for proper placing of microphones on the set, control of sound volume and selection of recordings.

Moviola: A small machine used in the cutting room, which projects the picture through a magnifying lens, and the sound on the other side through a loud-speaker.

Negative: Photographic material which has been exposed and developed, in which the light and shade areas are reversed from the original object.

Optical printer: A device for making special effects which consists of a projector and camera set up facing each other on a table at a distance of two feet. The camera and projector have interlocking motors.

Pan: Horizontal movement of the camera.

Playback: A device which repeats the sound record or disc shortly after it has been made.

Pre-record: To make a simultaneous sound recording on film and disc of a musical song or dance number. The scene containing the music is photographed silently while the actors time their movements to the disc which is played back.

Pre-score: Same as pre-record.

Print: One of several records on film made from a motion-picture negative.

Process shot: A scene projected through a translucent screen which is photographed as a background for action in motion pictures.

Quickie: A film produced for less than $50,000 in six days and nights.

Recorder: Member of the sound crew who is in charge of operating the recording machine and equipment in the recording building.

Re-record: The process of recording additional sounds and music for the picture after it has been photographed and the dialogue recorded.

Rewind: Metal support for two reels with crank so that they may be wound backwards or forwards.

Rough cut: The first rough assembly of the scenes according to the script.

Rough in: Block in the lighting on a motion-picture set.

Rushes: Same as dailies.

Scene: The action photographed from a single camera position.

Scrim: Frames of muslin or netting used to soften or eliminate direct sunlight from the players in exterior scenes.

Sequence: A series of scenes showing related action.

Set: A room, building or group of buildings constructed for motion pictures.

Set-up: A single camera position.

Shoot: To photograph the film.

Shooting schedule: The schedule made by the assistant director which lists the sets, actors, number of scenes, pages of dialogue and time required on each set.

Shooting script: The manuscript of the story organized into scenes, sequences and shots, from which the production is made.

Shot: A single image on the film.

Sound track: The film on which the sound is recorded. On the print, it occupies about one-tenth of an inch on the left-hand side between the perforations and the frame.

Splice: The joining together of two pieces of film with film cement.

Sprockets: The perforations on either side of the film, two on each side of the frame, three-sixteenths of an inch apart.

Stage helper: Assistant to the mixer.

Stand-in: Person resembling the star in general physical appearance who takes the place of the star while the lighting is adjusted between scenes.

Still man: A still photographer in a motion-picture studio.

Sync mark: That identification of the film and sound track by letters, numerals, clappers or electrical impulses to mark the corresponding point of synchronization at the beginning of a scene.

Synopsis: A brief summary of a motion-picture story in narrative form.

Take: A single record of an action on motion-picture film.

Transparency shot: Same as process shot.

Treatment: An adaptation of a story in terms of a motion picture upon which the script is based.

Trucking shot: A shot taken as the camera on a dolly moves in close to the scene.

Wipe: An effect achieved by the optical printer of shifting action from one scene or location to another. Also known as wipe-off.

Work print: Same as rough cut.